

# Solving taxonomic and nomenclatural problems among the Neotropical species of the family Mantispidae (Insecta, Neuroptera)

Renato Jose Pires Machado<sup>1</sup>, Hongyu Li<sup>2,3</sup>, Michael Ohl<sup>2</sup>

1 Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Brazil

2 Museum für Naturkunde Berlin, Invalidenstr. 43, 10115 Berlin, Germany

3 Department of Entomology, China Agricultural University, Beijing 100193, China

<https://zoobank.org/0625BBFD-D761-4A86-BA92-4E362BC2199B>

Corresponding author: Renato Jose Pires Machado (rjpmachado@gmail.com)

Academic editor: Susanne Randolph ♦ Received 3 February 2025 ♦ Accepted 7 April 2025 ♦ Published 24 June 2025

## Abstract

The present study focuses on solving some dubious species-group names in Neotropical Mantispidae (Insecta, Neuroptera). We analyzed type specimens deposited in European museums that were not available in recent taxonomic studies on the family. A total of 28 names were discussed here which resulted in 14 new synonyms and six new combinations. Four names are considered as *nomina dubia*. Ten lectotypes are designated. High resolution images of the type specimens of 19 species are provided here.

## Key Words

Lacewings, mantidflies, Mantipoidea, Neuropterida, type specimens

## Introduction

Mantispidae is a relatively small family of the insect order Neuroptera, which can be easily recognized by the raptorial forelegs and elongated prothorax, resembling small praying mantises. The mantidflies, as commonly known, are distributed worldwide and represented in the Neotropical region by all four subfamilies traditionally recognized: Calomantispinae, Drepanicinae, Mantispinae, and Symphrasinae (Ohl 2004). However recent phylogenetic studies have suggested a close relationship between Symphrasinae and the family Rhachiberothidae (Winterton et al. 2018; Ardila-Camacho et al. 2021; Lai et al. 2024; Ardila-Camacho and Contreras-Ramos 2025). Consequently, Symphrasinae has recently been placed in Rhachiberothidae as a subfamily (Ardila-Camacho et al. 2021, 2024; Ardila-Camacho and Contreras-Ramos 2025).

According to this more recent circumscription of the family excluding Symphrasinae, the Mantispidae is represented by 12 genera and 60 species in the Neotropical region: one genus in Calomantispinae: *Nolima* Navás (3 species); two in Drepanicinae: *Drepanicus* Blanchard

(5 species) and *Gerstaeckerella* Enderlein (6 species); and nine genera in Mantispinae: *Buyda* Navás (2 species), *Climaciella* Enderlein (14 species), *Dicromantispa* Hoffman (8 species), *Entanoneura* Enderlein (4 species), *Haematomantispa* Hoffman (2 species), *Leptomantispa* Hoffman (9 species), *Paramantispa* Williner & Kormilev (3 species), *Xeromantispa* Hoffman (1 species), and *Zeugomantispa* Hoffman (3 species) (Ohl 2004; Ardila-Camacho et al. 2023; Alvim et al. 2024; Oswald 2024).

The current genus level classification of the Neotropical Mantispidae, particularly of the Mantispinae, is mostly based on the revisionary study by Hoffman (2002). Historically, the majority of the Neotropical species was placed in the genus *Mantispa* Illiger, which is restricted to Europe based on the current understanding of the genus limits. The Neotropical species previously placed in *Mantispa* were transferred to six genera (*Buyda*, *Dicromantispa*, *Haematomantispa*, *Leptomantispa*, *Xeromantispa*, and *Zeugomantispa*) by Hoffman (2002), which was consequently followed by later studies partly or completely covering the Neotropical Mantispidae (Ohl, 2004; Machado and Rafael 2007, 2010; Reynoso-Velasco

and Contreras-Ramos 2010; Ardila-Camacho and García 2015; Hoffman et al. 2017; Ardila-Camacho et al. 2018; Snyman et al. 2018, 2020; Alvim et al. 2019, 2024; Machado and Martins 2022).

However, despite the immense progress in understanding the taxonomy of Neotropical Mantispidae in the past two decades and the seemingly taxonomic stability, a large number of species names remained dubious. The majority of these names have been proposed in the beginning of the last century by European authors as listed by Ohl (2004). The major problem with these names is that they are mostly based on insufficient descriptions and illustrations. Also, the geographic type locations are dubious in many cases, as mentioned by Machado and Martins (2022).

In this sense, our main objective here is to solve these dubious names of Neotropical Mantispidae. In order to accomplish it, we have examined many type specimens deposited in European collections, which were not available in recent taxonomic studies, and a total of 28 species names are discussed below.

## Material and methods

The type specimens studied here are currently housed in the following institutions:

<b>CN</b>	Navás collection, partly destroyed. Surviving remnants probably in MZBS (see Ohl, 2004).
<b>DEI</b>	Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany (formerly in Berlin-Dahlem and Eberswalde).
<b>ISNB</b>	Institut Royal des Sciences Naturelles de Belgique, Bruxelles, Belgium.
<b>MNHN</b>	Museum National d'Histoire Naturelle, Paris, France.
<b>MZBS</b>	Museo Zoología, Barcelona, Spain.
<b>MZPW</b>	Museum of the Institute of Zoology, Polish Academy of Sciences, Warszawa Poland.
<b>NHMUK</b>	The Natural History Museum, London, Great Britain.
<b>OUM</b>	University Museum, Oxford, Great Britain.
<b>ZIL</b>	Zoological Museum, Academy of Sciences, St. Petersburg, Russia.
<b>ZMUH</b>	Zoologisches Institut und Zoologisches Museum, Hamburg, Germany [The entire holometabolous collection, including catalogues, of the Hamburg museum (ZMUH) was destroyed during an air raid on 30 July 1943, except for some material on loan at that time and some specimens in alcohol. Thus, all type material of Mantispidae recorded from the ZMUH must be regarded as lost. See Ohl (2004)].
<b>ZSMC</b>	Zoologische Staatssammlung, München, Germany.
<b>ZMUM</b>	Zoological Museum, Moscow, Russia.

Genitalia preparation was made by macerating the apex of abdomen with heating plate at 125 °C in 10% KOH for 3–5 minutes. After rinsing the KOH with water, the apex of the abdomen was transferred to glycerine for further dissection and examination. Finally, it was moved to glycerine and stored in a microvial. Photographs of specimens were taken by using a Sony α7RIII camera with Canon Macro Photo Lens MP-E 65 mm lens. The genitalic photos were made with a Sony α7RIII camera and a Zeiss Axioskop optical microscope. The final figure plates were prepared with Adobe Photoshop CC®. The species are presented in alphabetical order by species epithet.

## Taxonomy

### *Leptomantispa axillaris* (Navás)

*Mantispa axillaris* Navás, 1908: 412. Syntypes: male, female (MNHN, MZBS). Type locality: Brazil: Goiás: Jataí.

**Notes.** This species was described by Navás (1908) based on a series of males and females from the municipality of Jataí in Goiás state in central Brazil. For a long time, this species was not mentioned again in the literature. It was listed by Penny (1977) and later redescribed by Penny and Costa (1983), but without seeing any of the syntypes. All subsequent identifications of this species were based on what was proposed by Penny and Costa (1983). Also, Machado and Rafael (2010) did not see any of the syntypes, but they transferred the species to *Leptomantispa*, the current placement of the species (Tauber et al. 2017; Ardila-Camacho et al. 2018; Alvim et al. 2019).

Although the taxonomic identity of *Mantispa axillaris* has never been seriously questioned, it can hardly be confirmed without studying at least one of the syntypes. Unfortunately, the types seem to be lost. Ohl (2004) indicated that they should be housed at MZBS and MNHN, but he did not locate them, and Tauber et al. (2017) presented the same conclusion, mentioning that they could not find the types. In fact, they suggested that a neotype should be designated. We also failed in confirming the whereabouts of the types in both collections during our study.

At the moment, we propose that *L. axillaris* should be treated as a valid name for the sake of nomenclatural stability. Furthermore, the interpretation of *axillaris*, proposed by Penny and Costa (1983), matches the original description, and many other specimens of *L. axillaris* have been recorded in areas very close to the type locality (Machado and Rafael 2010). We agree with Tauber et al. (2017) that a neotype should be designated, but we believe that this specimen should be from the type locality, and since no material from the locus typicus is available at the moment, we refrain from designating a neotype here.

### ***Dicromantispa basalis* (Navás)**

*Mantispilla basalis* Navás, 1927: 59. Holotype or Syntypes: female (CN). Type locality: Bolivia: La Paz: Coroico.

**Notes.** This species was described by Navás (1927) from the city of Coroico, in the department of La Paz in Bolivia. The original description explicitly mentions the female sex, although without explicitly giving the number of specimens available to Navás. Therefore, it cannot be unambiguously decided if the description was based on one or more specimens (Ohl 2004; Snyman et al. 2018).

The species was transferred to *Mantispa* by Penny (1977), which was followed by Ohl (2004), but it was listed again in *Mantispilla* Enderlein, the original genus, by Snyman et al. (2018). Both Ohl (2004) and Snyman et al. (2018) mentioned that the type or type series is supposedly deposited in Navás' collection, but we could not find any further information.

Without access to the types, the taxonomic identity of *M. basalis* poses some questions. Based on the original description, it is very likely that this species belongs in *Dicromantispa*, based on the overall body coloration. The species was described as presenting a yellowish color, a mark shaped as a “Y” at the vertex, anterior region of pronotum with three short longitudinal lines, and the forefemur internal surface darker, all characters associated with *Dicromantispa*. The original description also mentions that the forewing is hyaline with some yellow veins, characters that are currently associated with *D. gracilis*, which is a widespread species ranging from southern South America to Costa Rica, including records from Bolivia. In this sense, we are herein synonymizing *Mantispilla basalis* Navás, 1927 under *Dicromantispa gracilis* (Erichson, 1839) based on the original description of the species, since the type material is apparently lost. (new combination, new synonym)

### ***Mantispilla boliviiana* Navás**

*Mantispilla boliviiana* Navás, 1927: 58. Holotype or syntypes: female (CN). Type locality: Bolivia: Santa Cruz: Buena Vista.

**Notes.** The status of this species is similar to the previous one. It was described in the same publication (Navás 1927), also from Bolivia, but from Buena Vista in the department of Santa Cruz, based on one or more females. After that, the species was only listed by Penny (1977) and included in the world catalogue (Ohl 2004) in the genus *Mantispa*. As in *M. basalis* above, the female sex is mentioned, but it is unclear, if one or more specimens were available. The type material is also supposedly deposited in Navás' collection, but we could not find any information about it. Different from the previous species, the original description of *M. boliviiana* is more unspecific, which prevents us from unambiguously associating it with one of the

genera from South America. Based solely on the original description it is almost impossible to associate this species with one of the current valid genera, and for this reason and the absence of the type series, we are herein considering this species as a *nomen dubium*.

### ***Zeugomantispa chlorodes* (Navás)**

Fig. 1

*Mantispilla chlorodes* Navás, 1914a: 25. Lectotype: sex unknown (NHMUK) (here designated). Type locality: Panama: Chiriquí.

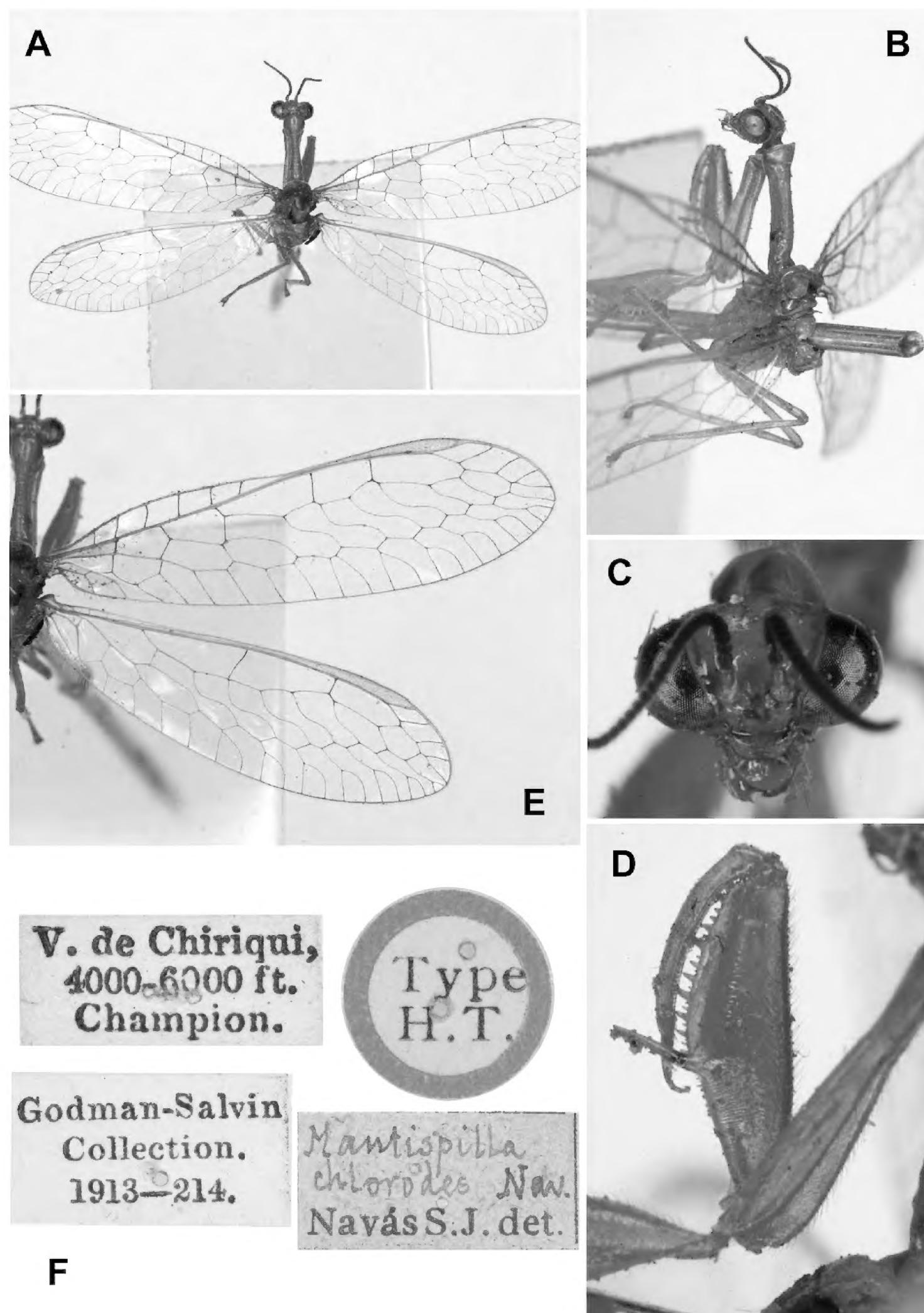
**Notes.** This species was described from Panama, Chiriquí valley, but the number of specimens used for the description is not clear, as evidenced by Ohl (2004). In this sense, we are herein designating the specimen from NHMUK, the sole specimen found here, as the lectotype. The species was treated in *Mantispa* by Penny (1977) and Ohl (2004), and more recently, it was transferred to *Zeugomantispa* by Snyman et al. (2018) without explicit justification. Herein after studying the lectotype (tip of the abdomen missing), we agree with Snyman et al. (2018) that the species belongs in *Zeugomantispa*. However, it is obvious that the species is a junior synonym of *Z. virescens* (Rambur). It shows all the major characters of *Z. virescens*, particularly a green pterostigma and the crossveins aa-ap straight in the forewing (Fig. 1E). This is one of the most widespread species in Mantispidae in the New World, with records from central Mexico to southern Brazil (Hoffman 2002; Machado and Martins 2022), with a long synonymic list (Ohl 2004). Therefore, we are herein synonymizing *Mantispilla chlorodes* Navás, 1914 under *Zeugomantispa virescens* (Rambur, 1842) (new synonym).

### ***Zeugomantispa chlorotica* (Navás)**

Fig. 2

*Mantispilla chlorotica* Navás, 1912: 200. Lectotype: female (ZSMC) (here designated). Type locality: Paraguay: San Bernardino.

**Notes.** The status of this species is very similar to the previous one. It was described by Navás (1912) from San Bernardino, Paraguay, but the number of specimens used for the description is not clear (Ohl 2004). In this sense, we are herein designating the female from ZSMC, the sole specimen found here, as the lectotype. After the original description, the species was listed in *Mantispa* by Penny (1977) and Ohl (2004), and more recently transferred to *Zeugomantispa* by Snyman et al. (2018) without any justification. Herein after analyzing the lectotype we reached the same conclusion, that this species has all the diagnostic characters of *Z. virescens* (Rambur). In this sense, we are herein synonymizing *Mantispilla chlorotica* Navás, 1912 under *Zeugomantispa virescens* (Rambur, 1842) (new synonym).



**Figure 1.** *Mantispa chlorodes* Navás 1914, lectotype, sex unknown. **A, B.** Habitus photo, dorsal and lateral views; **C.** Head, frontal view; **D.** Foreleg, outer surface; **E.** Right fore and hind wings; **F.** Labels.

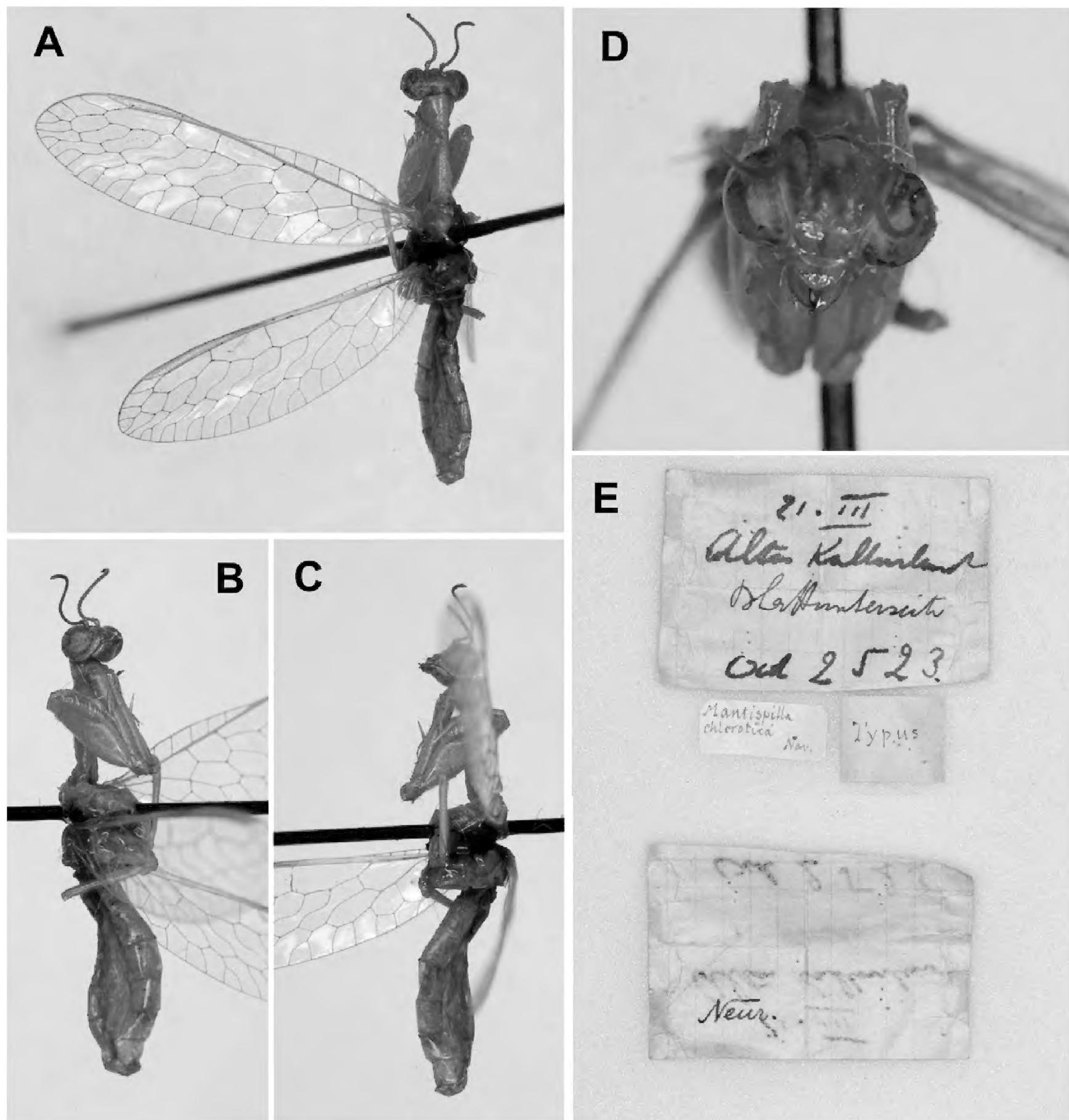
***Buyda confluens* (Navás)**

Fig. 3

*Mantispa confluens* Navás, 1914a: 19. Lectotype: male (NHMUK) (here designated). Type locality: Panama: Chiriquí: Bugaba.

**Notes.** The original description is not clear about the number of specimens used for the description, as evidenced by Ohl (2004), who stated “holotype (or syntypes)” when treating this species. In this sense, we are herein designating the male specimen from NHMUK, the sole spec-

imens found here, as the lectotype. After the description, the name was listed by Penny (1977) and included in the catalogue by Ohl (2004). Later, Ardila-Camacho et al. (2018) synonymized the species under *B. phthisica* (Gertschaeker), based on the original description and two illustrations provided by Navás (1914a), but without studying the type. After analyzing the lectotype, we herein confirm the synonymy proposed by Ardila-Camacho et al. (2018). The lectotype of *M. confluens* has all major characters of *B. phthisica*, and the description and illustrations presented by Navás (1914a) also matches with *B. phthisica*.



**Figure 2.** *Mantispilla chlorotica* Navás 1912, lectotype, female. **A–C.** Habitus photo, dorsal and lateral views; **D.** Head, frontal view; **E.** Labels.

#### *Climaciella cubana* Enderlein

Fig. 4

*Climaciella cubana* Enderlein, 1910: 362. Holotype: female (MZPW).  
Type locality: Cuba.

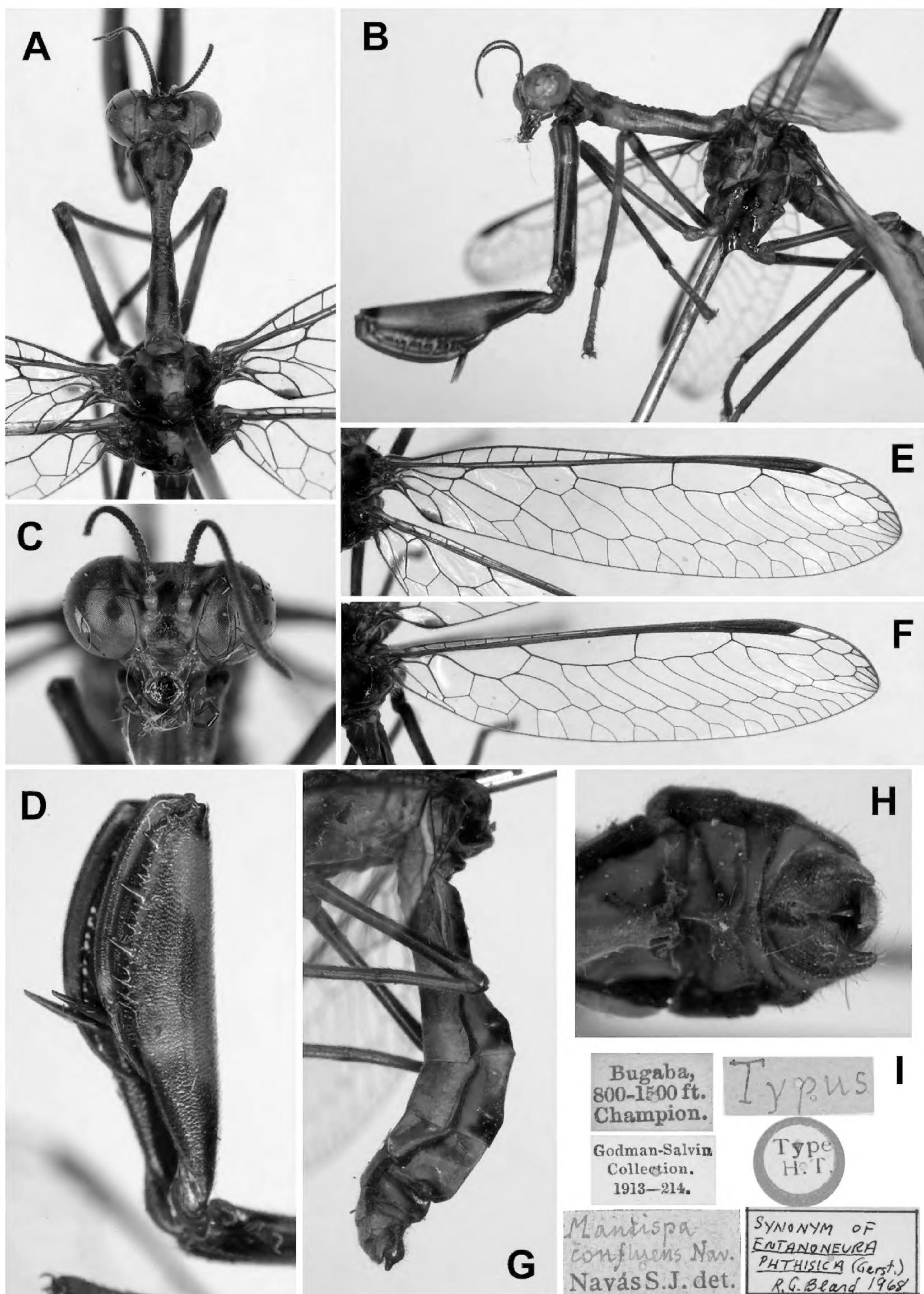
**Notes.** The taxonomic history of *C. cubana* is stable, and its identity is unquestionable. However, the species is included here because since its original description by Enderlein (1910), which did not include illustrations, the holotype has not been mentioned in any of the later publications focusing on the taxonomy of the genus (Handschin 1960; Alayo 1968; Hoffman et al. 2017). Our examination of the holotype leaves no doubt that the current understanding of the taxonomy of *C. cubana* is correct. The holotype perfectly matches the redescriptions, diagnoses and images presented in these papers (Handschin 1960; Alayo 1968; Hoffman et al. 2017).

#### *Zeugomantispa femoralis* (Navás)

Fig. 5

*Mantispa femoralis* Navás, 1914a: 25. Lectotype: female (NHMUK) (here designated). Type locality: Mexico: Veracruz: Orizaba

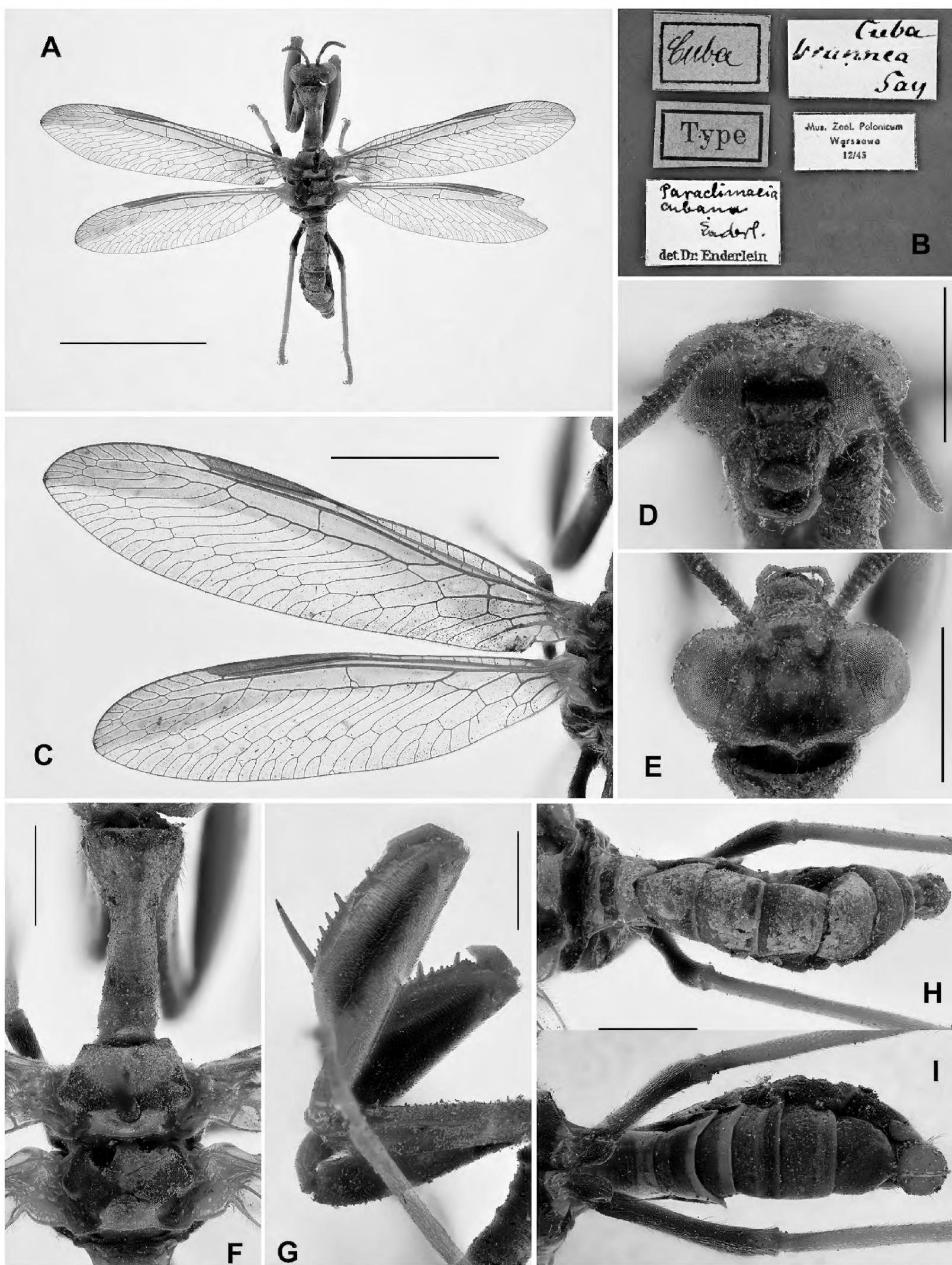
**Notes.** Since its original description by Navás (1914a) no other taxonomic paper treated this species, and there are no images of the species available in the literature. The original paper is not clear about the number of specimens used for the description, as evidenced by Ohl (2004). In this sense, we are herein designating the sole female specimen from NHMUK as the lectotype. After its original description, the species was listed by Penny (1977) and included in the world catalogue by Ohl (2004). More recently, Snyman et al. (2018) transferred the species to *Zeugomantispa* without explicit justification. Herein after analyzing the lectotype,



**Figure 3.** *Mantispa confluens* Navás 1914, lectotype, male. **A, B.** Head and thorax, dorsal and lateral views; **C.** Head, frontal view; **D.** Foreleg, outer surface; **E.** Right forewing; **F.** Right hind wing; **G.** Abdomen, lateral view; **H.** Genitalia, dorsal view; **I.** Labels.

we can conclude that it is a female, and, in fact, it belongs to *Zeugomantispa*, based on the pronotal setae arising from distinct bumps (Fig. 5B). However, the species clearly presents all diagnostic characters of *Z. minuta* (Fabricius): the green pterostigma, and the aa-ap crossvein curved posteriorly in the forewing (Hoffman 2002) (Fig. 5E).

*Zeugomantispa minuta* is a widespread species with records from USA to South America, including some Caribbean islands, with a long list of synonyms, many described by Navás (Ohl 2004). In this sense, we are convinced that *Mantispa femoralis* Navás is a junior synonym of *Zeugomantispa minuta* (Fabricius) (new synonym).



**Figure 4.** *Climaciella cubana* Enderlein, 1910, holotype, female. **A.** Habitus photo, dorsal view; **B.** Labels; **C.** Left fore- and hind wings; **D, E.** Head, frontal and dorsal views; **F.** Thorax, dorsal view; **G.** Forelegs; **H.** Abdomen, dorsal view; **I.** Abdomen, ventral view. Scale bars: 10.0 mm (A); 5.0 mm (C); 2.0 mm (D–I).

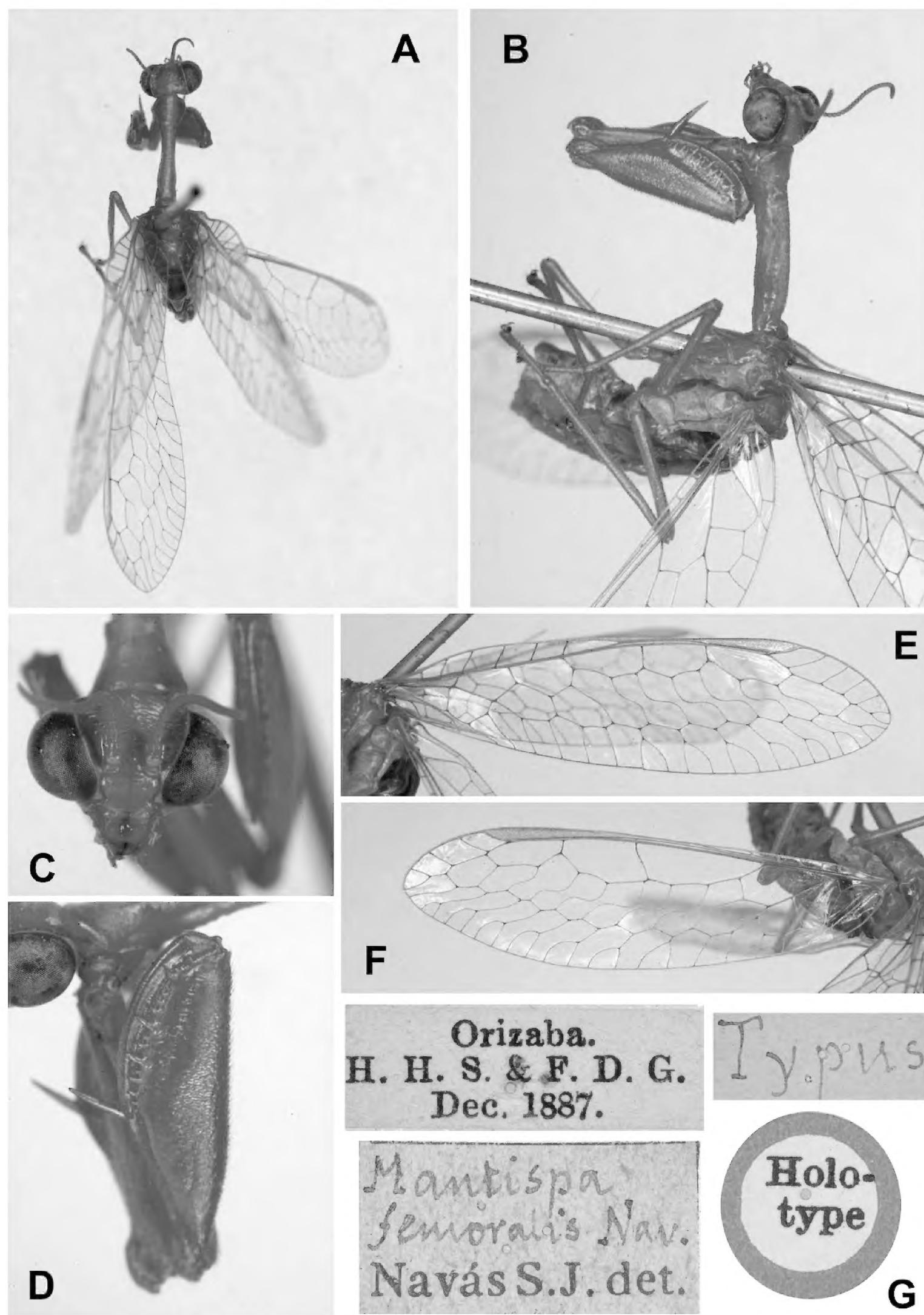
#### *Dicromantispa flavicauda* (Navás)

Fig. 6

*Mantispa flavicauda* Navás, 1914c: 86. Lectotype: male (NHMUK) (here designated). Type locality: Mexico: Guerrero: Venta de Zopilote

**Notes.** The status of this species is similar to the previous two species. It was described by Navás (1914c) from Venta de Zopilote at Guerrero state, Mexico, but

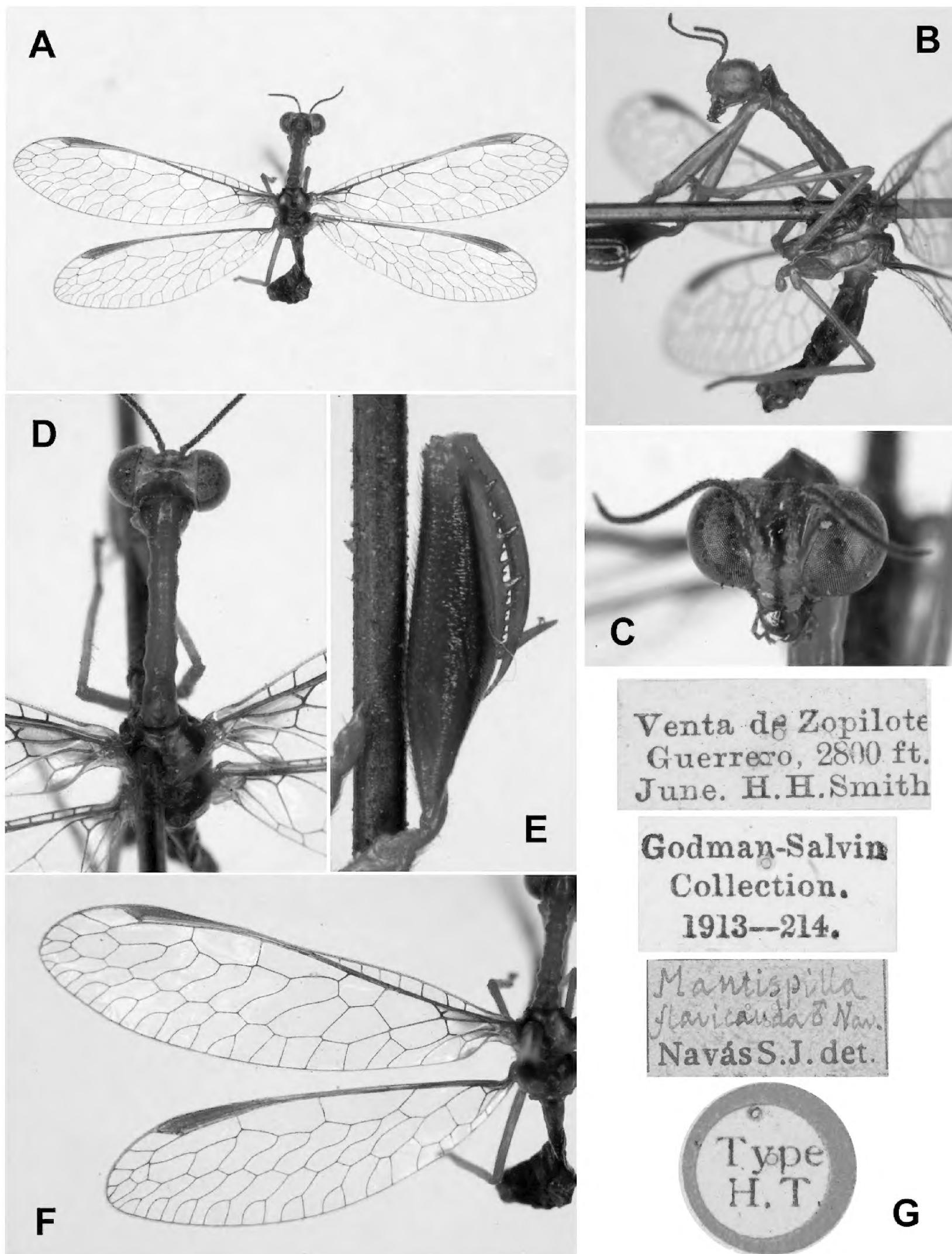
the number of specimens used for the description is not clear (Ohl 2004). In this sense, we are herein designating the sole male from NHMUK as the lectotype. After the original description, the species was treated in *Mantispa* by Penny (1977) and Ohl (2004), and more recently transferred to *Dicromantispa* by Snyman et al. (2018) without justification. After analyzing the lectotype, we agree with Snyman et al. (2018) that the species belongs to *Dicromantispa*.



**Figure 5.** *Mantispa femoralis* Navás 1914, lectotype, female. **A, B.** Habitus photos, dorsal and lateral views; **C.** Head, frontal view; **D.** Foreleg, outer surface; **E.** Right forewing; **F.** Right hind wing; **G.** Labels.

*Dicromantispa* is currently known from Mexico by two species, *D. interrupta* and *D. sayi*, including records from Guerrero of both species (Reynoso-Velasco and Contreras-Ramos 2010). *Mantispsilla flavicauda* can be easily distinguished from *D. interrupta*, because the latter has specific marks on the forewings, but there is nothing that separates it from *D. sayi*, a widespread species with records from most of the USA south to Panama, including many of the Caribbean islands (Hoffman et al. 2017).

*Dicromantispa sayi* presents some color variation of the head and antennae (Hoffman 1989) but the lectotype of *M. flavicauda* clearly fits within the known range of variations. Unfortunately, we only had access to images of the lectotype of *M. flavicauda*, and, therefore, we could not dissect the taxonomically significant genitalia. However, based on the current evidence, we are convinced that *Mantispsilla flavicauda* Navás, 1912 is a junior synonym of *Dicromantispa sayi* (Banks, 1897) (new synonym).



**Figure 6.** *Mantispilla flavicauda* Navás 1914, lectotype, male. **A, B.** Habitus photo, dorsal and lateral views; **C.** Head, frontal view; **D.** Head and thorax, dorsal view; **E.** Foreleg, outer surface; **F.** Left fore and hind wings; **G.** Labels.

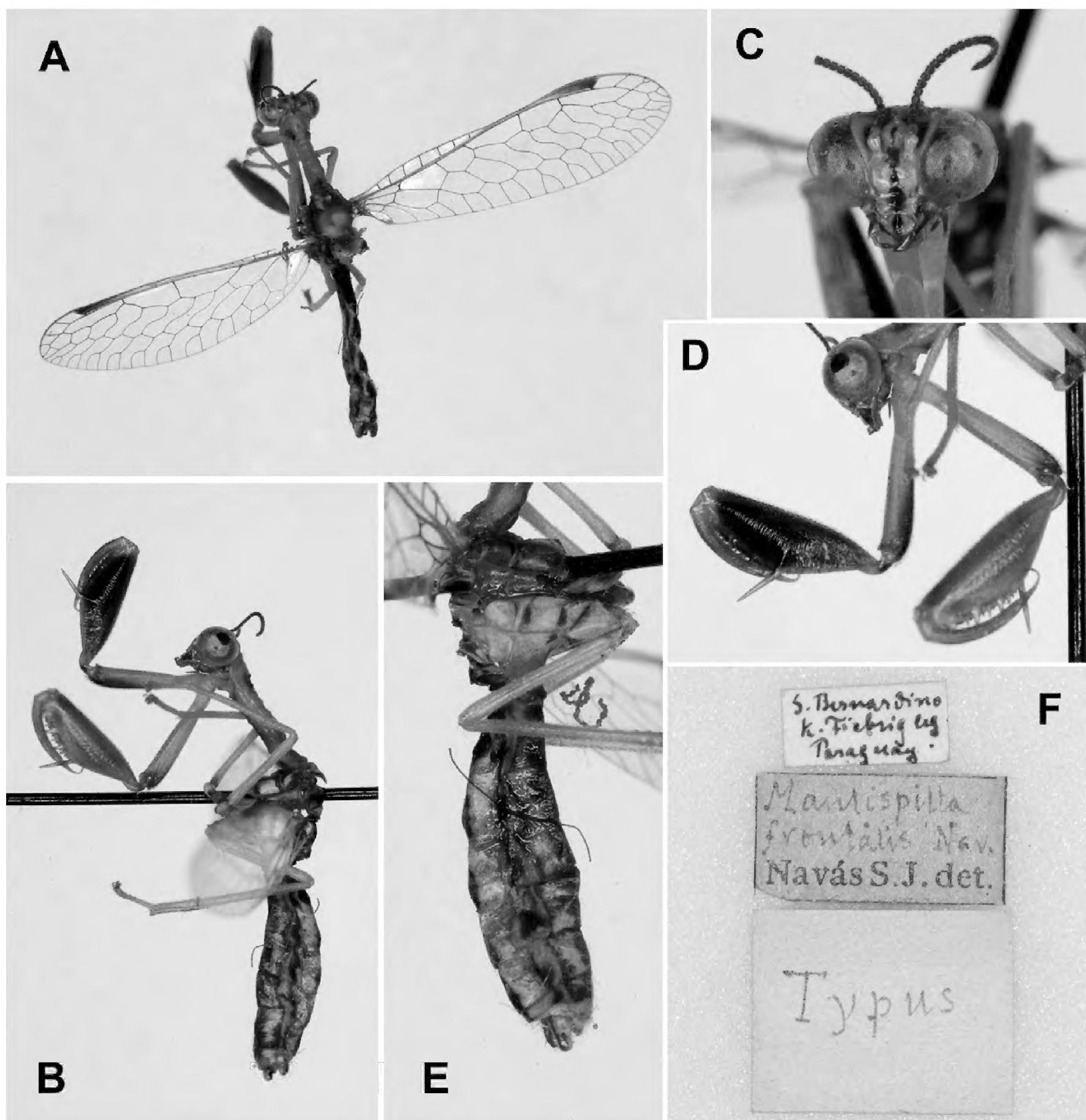
#### *Dicromantispa frontalis* (Navás)

Fig. 7

*Mantispilla frontalis* Navás, 1914b: 232. Lectotype (here designated): male (ZSMC). Type locality: Paraguay: San Bernardino.

**Notes.** The status of this species is similar to the previous one. It was described by Navás (1914b) from San Bernardino, Paraguay, but the number of specimens used for the description is not clear. In this sense, we are herein

designating the sole male from ZSMC as the lectotype. After the original description, the species was listed in *Mantispida* by Penny (1977) and Ohl (2004). More recently it was transferred to *Dicromantispa* by Snyman et al. (2018) without explicit justification. After studying the lectotype, we agree with Snyman et al. (2018) that the species belongs in *Dicromantispa*. In addition, the lectotype of *M. frontalis* shows all the major characters of *D. gracilis*. The hyaline wings, the yellow subcostal vein in the forewing, and more importantly, the color



**Figure 7.** *Mantispilla frontalis* Navás 1914, lectotype, male. **A, B.** Habitus photo, dorsal and lateral views; **C.** Head, frontal view; **D.** Forelegs; **E.** Pterothorax and abdomen, lateral view; **F.** Labels.

and shape of the male ectoproct in dorsal view (Fig. 7A) totally matches the diagnostic characters of *D. gracilis*, a widespread species in the Neotropical region as discussed above. Therefore, we herein synonymize *Mantispilla frontalis* Navás, 1914 with *Dicromantispa gracilis* (Erichson, 1839) (new synonym).

#### *Gerstaeckerella gigantea* Enderlein

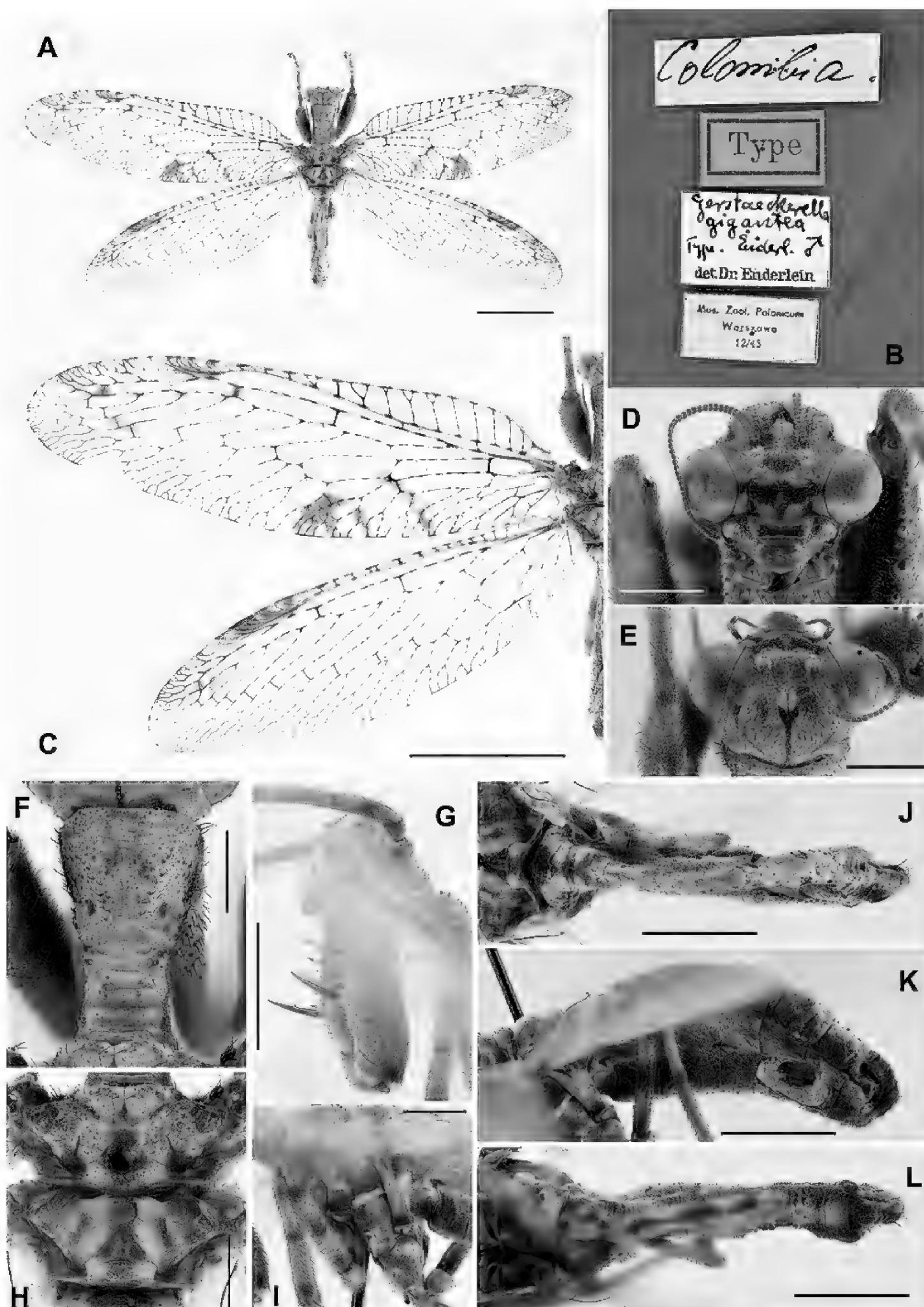
Fig. 8

*Gerstaeckerella gigantea* Enderlein, 1910: 370. Holotype: female (MZPW). Type locality: Colombia

**Notes.** This species also does not pose any taxonomic problems, but after the original description by Enderlein (1910), no subsequent taxonomic paper has commented

on the holotype. This research gap can also be recognized by the fact that the holotype is a female (Fig. 8K), and not a male, as claimed in the original description (Enderlein 1910) and followed by subsequent authors (Stange 1967; Penny and Costa 1983; Ohl 2004; Ardila-Camacho and García 2015). However, despite this error, the taxonomic understanding of this species in the literature corresponds exactly with the holotype, thus reinforcing the taxonomic stability of the species (Williner and Kormilev 1958; Poivre 1978; Penny and Costa 1983).

A question related to this species was raised by Penny and Costa (1983) regarding the type locality. Enderlein (1910) stated “Columbien” in the original description, which is corroborated by the specimen’s locality label (Fig. 8B). However, Penny and Costa (1983) discussed that the type locality is dubious, since all other records of the species are from southern South America (Argentina, Brazil (Paraná



**Figure 8.** *Gerstaeckerella gigantea* Enderlein 1910, holotype, female. **A.** Habitus photo, dorsal view; **B.** Labels; **C.** Left fore and hind wings; **D, E.** Head, frontal and dorsal views; **F.** Prothorax, dorsal view; **G.** Forelegs; **H, I.** Pterothorax, dorsal and lateral views. **J–L.** Abdomen, dorsal, lateral and ventral views. Scale bars: 10.0 mm (A, C); 5.0 mm (G–L); 2.0 mm (D–F).

and Santa Catarina states), Paraguay and Uruguay). Although most records for *G. gigantea* are indeed from the southern Neotropics, Penny and Costa (1983) ignored a second specimen studied by Williner and Kormilev (1958) from Colombia, Rio Claro in the Antioquia Department (erroneously mentioned as the type locality of the species by the authors, which was later followed by Ardila-Camacho and Garcia (2015)). The existence of this second specimen from Colombia strongly suggests that the type locality is likely to be correct. However, a genetic study of *G. gigantea* would be of great interest, considering the large geographic distance between the known records.

### *Mantispa gillavryna* Navás

*Mantispa gillavryna* Navás, 1926b: 6. Holotype: female (CN). Type locality: Suriname: Paramaribo

**Notes.** This species was described by Navás (1926b) explicitly based on a female from Paramaribo, Suriname, and posteriorly mentioned again by the same author (Navás 1929b). Subsequently, the species was transferred to *Mantispa* by Penny (1977) which was accepted by Ohl (2004) but returned to *Mantispa* by Snyman et al. (2018). The holotype was supposedly

deposited in Navás' collection but we could not get any information about it, strongly suggesting that it is probably lost. Based on the original description we can certainly assume that the species is related to *Zeugomantispa*, since it is mentioned that the specimen body is mostly green, including the wing venation and pterostigma. These characteristics clearly assigns *M. gillavryna* to *Zeugomantispa*, but it is not possible to unambiguously associate it with one of the three current valid species in the genus. The green color of the pterostigma can exclude *Z. compellens* (Walker, 1860), which presents a red pterostigma, but it cannot exclude *Z. minuta* (Fabricius, 1775) nor *Z. virescens* (Rambur, 1842). The type locality of *M. gillavryna* also does not help, since both *Z. minuta* and *Z. virescens* potentially occur in Suriname. Since the type is not accessible, and since the original description is ambiguous, we propose to treat *M. gillavryna* as a *nomen dubium*.

### *Dicromantispa gounellei* (Navás)

Fig. 9

*Mantispilla gounellei* Navás, 1934: 16. Lectotype: male (MNHN). Type locality: Brazil: Santa Catarina: Joinville: Salto do Piraí.

**Notes.** This species was described by Navás (1934) based on a type series from Salto do Piraí, which is an area around a waterfall in the Piraí river, currently located at the municipality of Joinville, state of Santa Catarina, Brazil. In the original description, the author was not clear about the number of specimens that the description was based on, but at least one female was mentioned as deposited at MNHN. Later, Penny (1982) stated that he examined the male "holotype" of *M. gounellei* deposited at MNHN. Tauber et al. (2017) also examined the type and confirmed that it was a male. They stated that Penny's (1982) reference to the putative holotype constitutes a valid lectotype designation. After examining this specimen, we confirm that it is a male specimen.

*Mantispilla gounellei* was transferred to *Mantispa* by Penny (1977), but a few years later, Penny himself synonymized it under *Mantispa gracilis* Erichson (today *D. gracilis*) (Penny, 1982). This synonymy was followed by all subsequent authors (Penny and Costa 1983; Carvalho and Courseil 1995; Ohl 2004; Machado and Rafael 2010; Ardila-Camacho and García 2015; Tauber et al. 2017; Ardila-Camacho et al. 2018). However, our examination of the lectotype clearly shows that the species is not a synonym of *D. gracilis* but a synonym of *D. debilis* (Gerstaecker, 1888). The membrane of the base of the forewing in the lectotype is brown (Fig. 9A, B, F), different from the hyaline forewing base of *D. gracilis*. Furthermore, the male terminalia leaves no doubt that this is in fact *D. debilis*. In this sense, we are herein synonymizing *Mantispa gounellei* Navás, 1934 under *D. debilis* (Gerstaecker, 1888) (new synonym).

### *Dicromantispa gracilis* (Rambur)

Fig. 10

*Mantispa gracilis* Rambur, 1842: 433. Lectotype: female (ISNB) (here designated). Type locality: Colombia: Santa Fé de Bogotá.

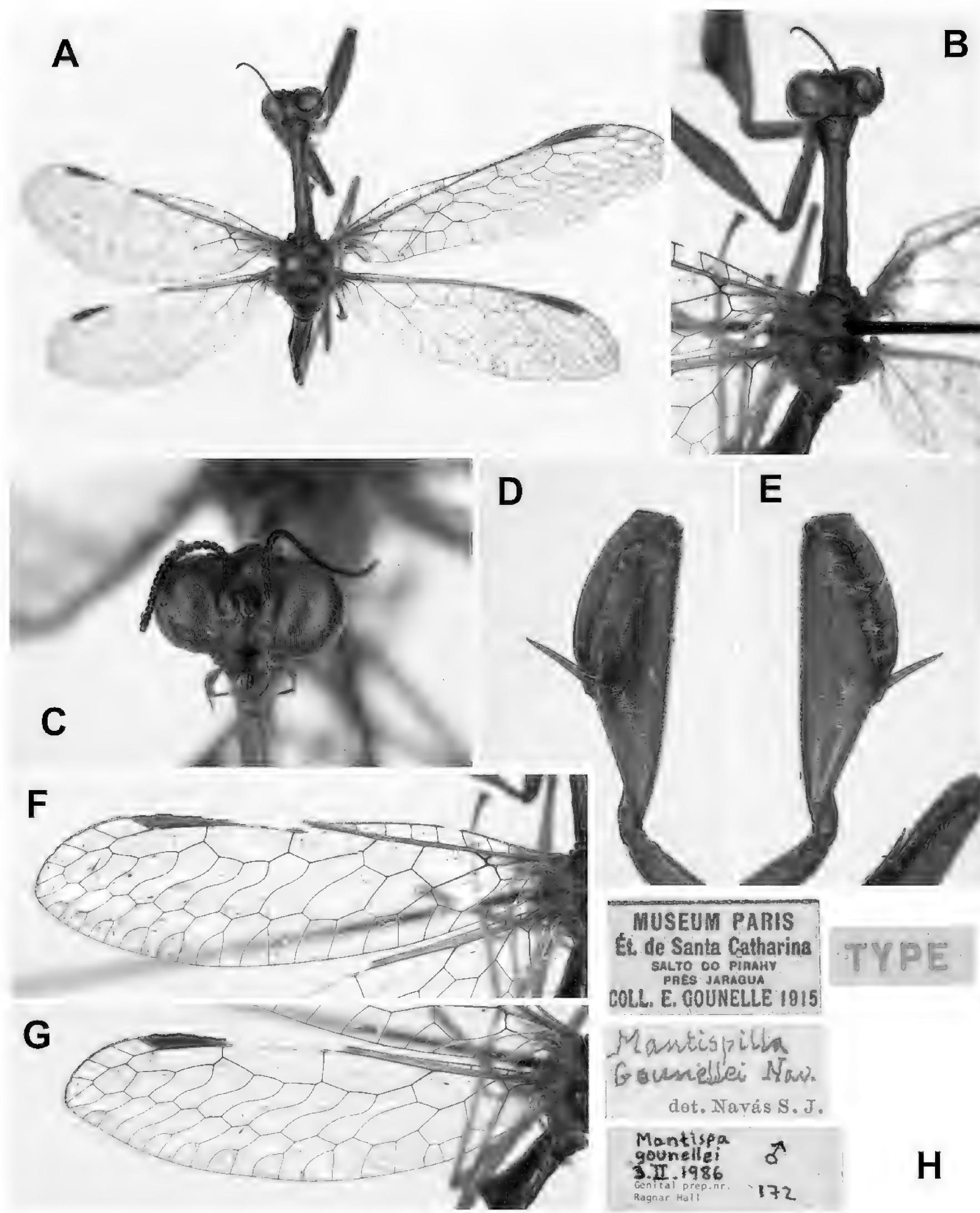
**Notes.** This species has a problematic taxonomic history. Its original description by Rambur (1842) is not clear about the number of specimens on which the description was based, nor where they were deposited. No other information about the type specimens were mentioned until the world catalogue of Mantispidae by Ohl (2004), who was also not sure about the type number and status ("holotype (or syntypes), sex unknown"). Tauber et al. (2019) presented one female syntype deposited at OUM. Herein, we had access to two apparent syntypes, a female from ISNB (Fig. 10A–C) and the female at OUM (Fig. 10D–H). They are indeed conspecific, and their labels suggest that they were both part of the original type series. Furthermore, one of the labels on the ISNB specimen mentions "type n° = 3" (Fig. 10C), suggesting the possibility of more than two syntypes, but the true number of syntypes cannot be confirmed based on the original description (Rambur 1842). In this sense, in order to avoid any other future taxonomic problem, we are herein designating the female specimen from ISNB as the lectotype, because it is in better condition than the specimen from OUM.

Another problem with this species is that the name *Mantispa gracilis* Rambur, 1842 is a junior primary homonym of *Mantispa gracilis* Erichson, 1839, as firstly noted by Hagen (1861), but in more details discussed by Ohl (2004). Remarkably, our analysis of the syntypes of *M. gracilis* Rambur clearly indicate that this species is, in fact, a synonym of *M. gracilis* Erichson. The species published by Rambur (1842) presents all the major diagnostic characters of the species described by Erichson (1839), which by its turn is today considered a valid species, *Dicromantispa gracilis* (Erichson). See the discussion for *Mantispa iridipennis* Guérin-Méneville below for more details.

### *Zeugomantispa gradata* (Navás)

*Mantispilla gradata* Navás, 1926a: 86. Holotype or syntypes: female (CN). Type locality: Brazil: Mato Grosso do Sul: Corumbá.

**Notes.** The condition of this species is very similar to *Mantispilla basalis* presented above. It was described by Navás (1926a) from the municipality of Corumbá, at the state of Mato Grosso do Sul, Brazil. The original description does not explicitly state the number of specimens available, but at least one female was mentioned. The species was treated in *Mantispa* by Penny (1977), Ohl (2004), and Snijman et al. (2018). The type series was supposedly deposited in Navás' collection but we could not get any information about it. It is probably lost. However, the original description mentioned that the body is mostly yellow to green, there are red marks on the head,



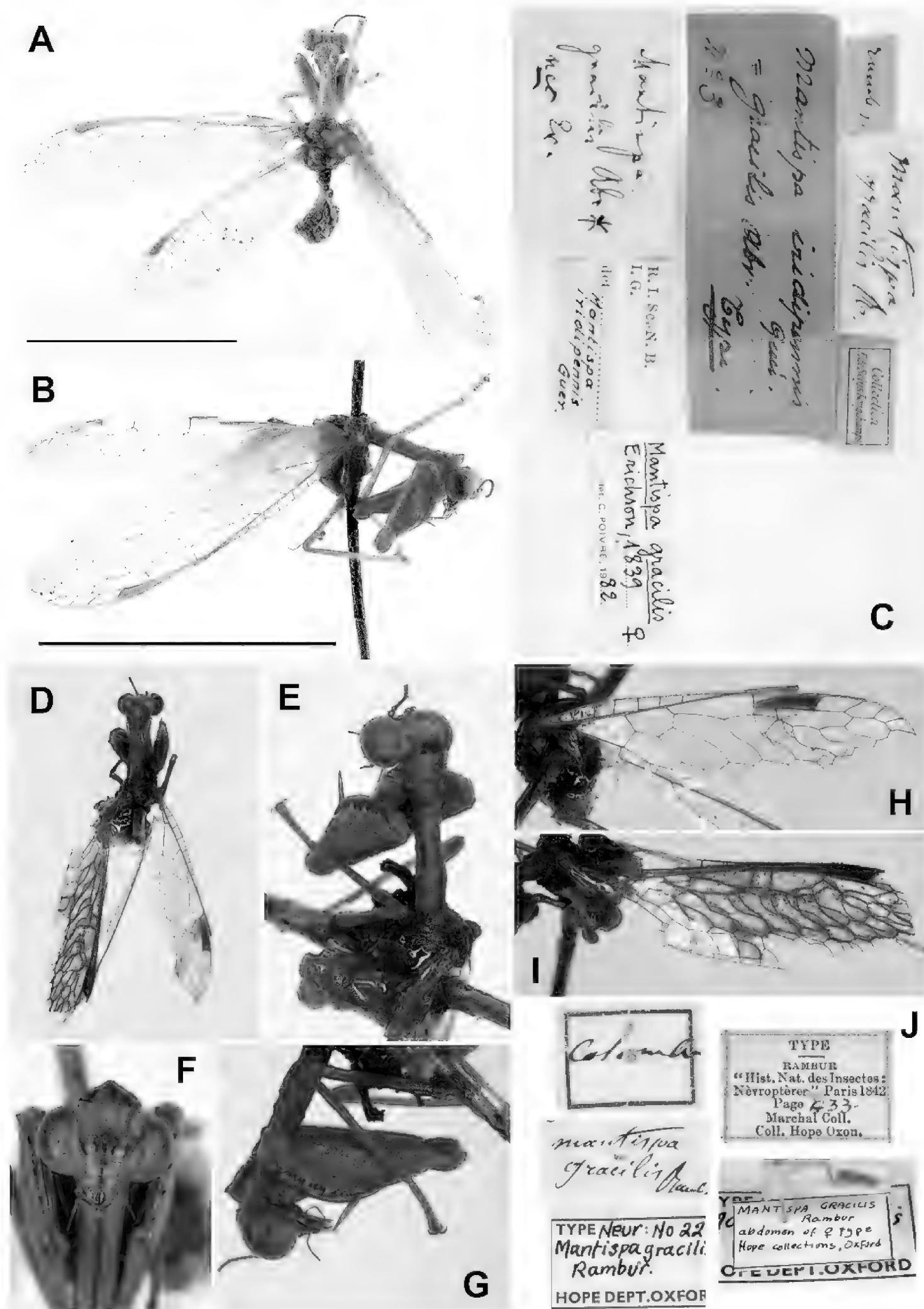
**Figure 9.** *Mantispilla gounellei* Navás 1934, lectotype, male. **A.** Habitus photo, dorsal view; **B.** Head and thorax, dorsal view; **C.** Head, frontal view; **D, E.** Foreleg, inner and outer surfaces; **F, G.** Left fore and hind wings; **H.** Labels.

the wings are hyaline with pterostigma green, and the pronotum is rugose, all characters suggesting that this species should be placed in *Zeugomantispa*. Furthermore, based on the color of the pterostigma and the type locality it is very likely that *M. gradata* is another synonym of *Z. virescens*. In this sense, we are herein synonymizing *Mantispilla gradata* Navás, 1926 under *Zeugomantispa virescens* (Rambur, 1842) based solely on the original description of the species. (new combination, new synonym)

#### *Dicromantispa iridipennis* (Guérin-Méneville)

*Mantispa iridipennis* Guérin-Méneville, 1844: 392. Holotype or synatypes: sex unknown, depository unknown. Type locality: Colombia

**Notes.** The original description of this species is very brief and does not provide any information about the type material (Guérin-Méneville 1844). However, only a few years after the original publication, the species was



**Figure 10.** *Mantispidae gracilis* Rambur 1842, type material, female. **A–C.** Lectotype: **A**, **B**. Habitus photo, dorsal and lateral views; **C**. Labels; **D–H.** Paralectotype: **D**. Habitus photo, dorsal view; **E**. Head and thorax, lateral view; **F**. Head, frontal view; **G**. Foreleg, outer surface; **H**. Right forewing; **I**. Left wings; **J**. Labels. Scale bars: 10.0 mm (**A**, **B**).

synonymized with *M. gracilis* Rambur by Westwood (1852). All subsequent studies followed this suggestion (Walker 1853; Hagen 1861, 1866; Penny 1977) but some authors indicated that this synonymy is questionable (Ohl 2004; Snyman et al. 2018; Tauber et al. 2019). As discussed above, *M. gracilis* Rambur is a junior primary homonym of *M. gracilis* Erichson, and for this reason, *M. iridipennis* was treated as a valid species by Ohl (2004), which was followed by Snyman et al. (2018). It was considered *incertae sedis* by Ardila-Camacho and García (2015).

Despite the fact that the type material of *M. iridipennis* is apparently lost, the available information suggests that the species is a synonym of *M. gracilis* Erichson. As mentioned before, every study that included *M. iridipennis* considered it as a synonym of *M. gracilis* Rambur, which by its turn was considered herein as a synonym of *M. gracilis* Erichson (see above). Furthermore, despite being very brief, the original description of *M. iridipennis* says that the body is brown, and the major veins of the wings are yellow, characters that match with *M. gracilis*

Erichson. In fact, the yellow color of the veins is the major diagnostic character as proposed by Hoffman (2002) to separate *D. gracilis* (Erichson) when describing the genus *Dicromantispa*. In this sense, we are herein synonymizing *Mantispa iridipennis* Guérin-Méneville with *Dicromantispa gracilis* (Erichson) (new synonym).

### ***Campion latifrons* (Enderlein)**

Fig. 11

*Mantispa latifrons* Enderlein, 1910: 355. Holotype: male (MZPW). Type locality: Brazil: Pará: Faro.

**Notes.** In the original description, Enderlein (1910) explicitly mentioned a single male holotype from Faro, today a municipality in the state of Pará in the middle of the Amazon rainforest (Fig. 11B). Penny (1977) listed this species, but he erroneously mentioned Mexico as its geographic origin instead of Brazil. Subsequently, the species was again mentioned by Ohl (2004) and Snyman et al. (2018). This species is one of the dubious names from the Neotropical region, which are still valid and until now placed in *Mantispa*. However, after the examination of the male holotype, it is clear to us that the type locality of the species is the result of mislabeling. The specimen has all the diagnostic characters of the Australian genus *Campion* Navás, including the simple claws on the mid and hind legs (Fig. 11K). Dissection of the male genitalia also confirms that the species belongs to *Campion*, including the presence of scattered small thick spines distally on the medial margin of the ectoproct, instead of a distinct ventromedial lobe, dorsal membranous region between gonocoxites 9 with a pair of oblique strip-like sclerites, hypomeres absent but membrane lateral to apex of gonocoxites 10 (mediuncus) with a patch of setal bases (Fig. 11N–Q). Furthermore, the species is probably a synonym of *C. tenuistriga* (Gerstaecker, 1885), a widespread species in Australia (Lambkin 1986; Ohl 2004). No other species with these characters has been reported outside of Australia. It is highly likely that the type specimen of *Mantispa latifrons* was mislabeled and actually does not occur in the New World. Herein, the combination, *Campion latifrons* (Enderlein, 1910) (new combination) is tentatively proposed. The taxonomic status of this species requires further study.

### ***Dicromantispa lineaticollis* (Enderlein)**

Fig. 12

*Mantispa lineaticollis* Enderlein, 1910: 348. Holotype: female (MZPW). Type locality: Brazil: Pará: Faro.

**Notes.** In the original description, Enderlein (1910) mentioned the holotype as a male, instead after analyzing the specimen herein it is clear that it is a female. The principal publication about this species after its original

description is Penny (1982), who redescribed *M. lineaticollis* based on one male. However, Penny explicitly mentioned that he did not see the holotype, and that his conclusion could be erroneous. Penny's interpretation was followed by some later studies on the Brazilian mantispids (Penny and Costa 1983; Carvalho and Corseuil 1995). Machado and Rafael (2010) studied images of the holotype of *M. lineaticollis* and concluded that the species is a synonym of *Dicromantispa debilis* (Gerstaecker). At that time *D. debilis* was considered to be a synonym of *M. compellens* Walker as proposed by Penny (1982), but later it was revalidated by Hoffman (2002, see also Ohl 2004). The synonymy of *M. lineaticollis* under *D. debilis* was accepted by all following publications (Ardila-Camacho and García 2015; Ardila-Camacho et al. 2018). Herein, after analyzing the holotype, we agree with the conclusion by Machado and Rafael (2010) that *M. lineaticollis* is a junior synonym of *D. debilis*.

### ***Dicromantispa luederwaldti* (Enderlein)**

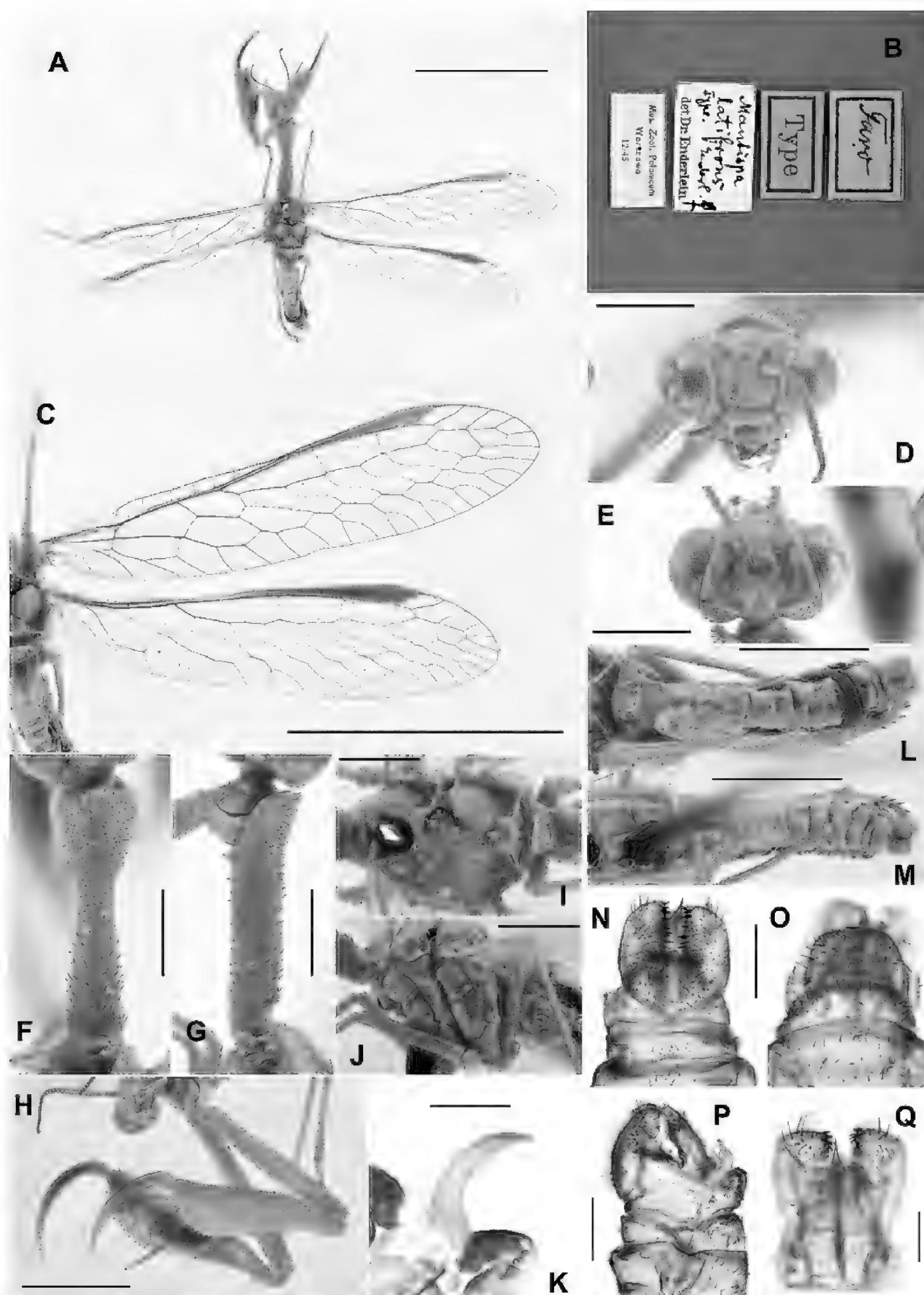
Fig. 13

*Mantispa luederwaldti* Enderlein, 1910: 353. Holotype: female (MZPW). Type locality: Brazil: Santa Catarina.

**Notes.** The original description mentioned that the species was based on a male holotype from the state of Santa Catarina, southern Brazil (Enderlein 1910). This species is one of those dubious names from the Neotropical region, which are still kept in *Mantispa*. Since its description it was only listed in three posterior publications without any taxonomic comment (Penny 1977; Ohl 2004; Snyman et al. 2018).

After studying the holotype, it became obvious that it is a female (Fig. 13K, L) and not a male as claimed in the original description (Enderlein 1910) and followed by subsequent authors (Ohl 2004; Snyman et al. 2018). We also conclude that it belongs in *Dicromantispa*, based on the overall brown body coloration and the pronotum (Fig. 13H) with a few scattered setae in lateral view. Furthermore, the holotype presents all major diagnostic characters of *D. synapsis* Hoffman, like the interrupted longitudinal brown line at the frons (Fig. 13D, E), and the presence of a plate covered by microspines anterior to the bursa in the female terminalia (Hoffman 2002; Machado and Rafael 2010). *Dicromantispa synapsis* is a relatively common species with records from Brazil, Costa Rica, French Guiana and Panama, but its holotype is actually from the state of Santa Catarina, just like *M. luederwaldti*. Specimens of this species were actually studied by Penny (1982), Penny and Costa (1983) and Carvalho and Corseuil (1995) but were treated as *M. lineaticollis* as discussed by Machado and Rafael (2010).

Based on the arguments mentioned above we are herein synonymizing *Dicromantispa synapsis* Hoffman, 2002 under *Dicromantispa luederwaldti* (Enderlein, 1910) (new combination; new synonym).



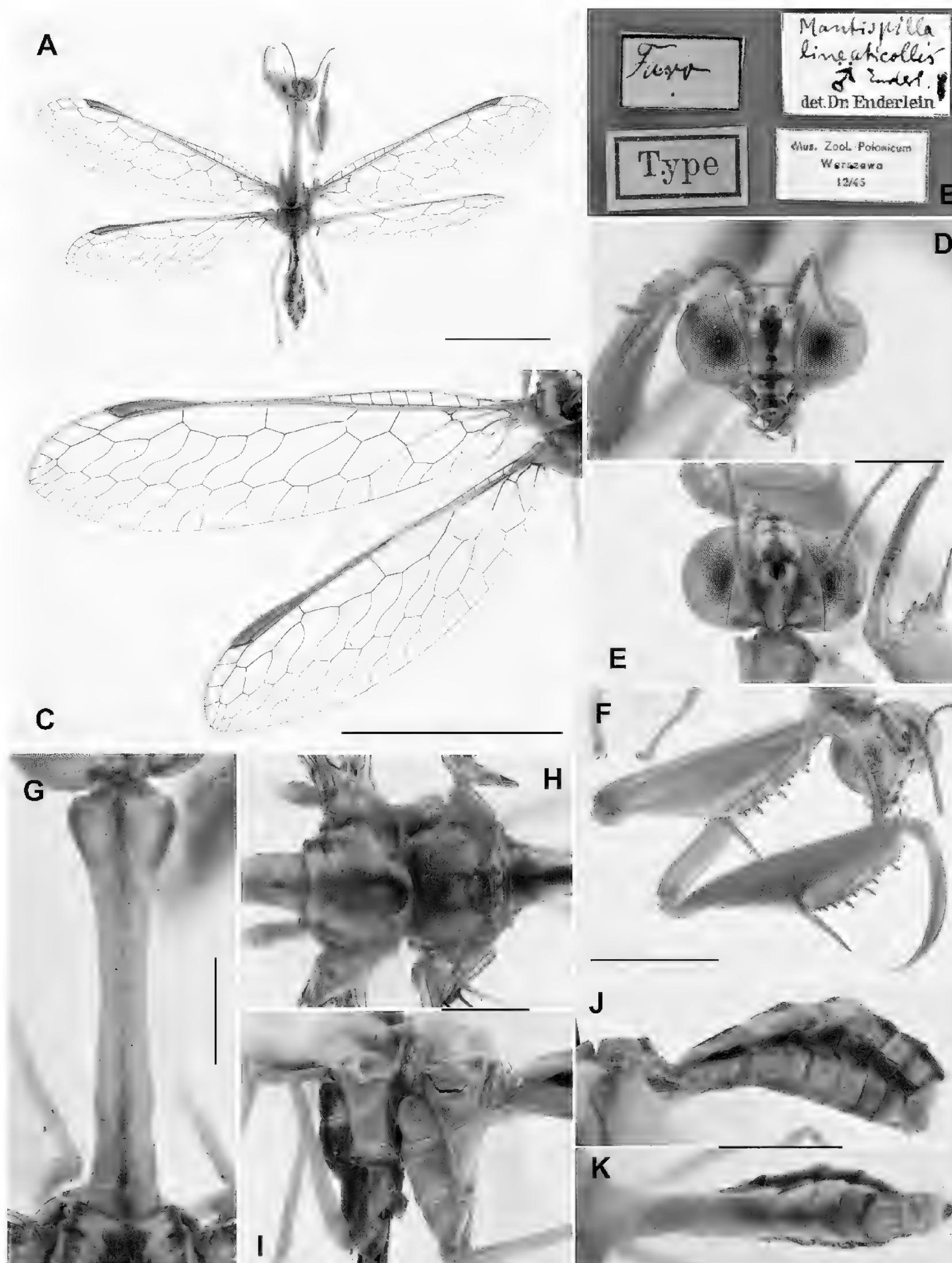
**Figure 11.** *Mantispa latifrons* Enderlein 1910, holotype, male. **A.** Habitus photo, dorsal view; **B.** Labels; **C.** Right fore and hind wings; **D, E.** Head, frontal and dorsal views; **F, G.** Prothorax, dorsal and lateral views; **H.** Forelegs; **I, J.** Pterothorax, dorsal and lateral views. **K.** Claw of mid leg; **L, M.** Abdomen, dorsal and ventral views; **N–Q.** Genitalia, dorsal, ventral, lateral and caudal views. Scale bars: 5.0 mm (A, C); 2.0 mm (D, E, H); 1.0 mm (F, G, I, J, L, M); 0.5 mm (K, N–P); 0.25 mm (Q).

#### *Raphidia margaritacea* Fischer von Waldheim

*Raphidia margaritacea* Fischer von Waldheim, 1834: 330. Holotype or syntypes: sex and depositary unknown. Type locality: Brazil

**Notes.** This species was described by Fischer von Waldheim (1834) in his study about the Orthoptera and Neuroptera from Brazil. The description is very brief and not

very informative and the type series is apparently lost, as shown by Ohl (2004). After the original description, the first paper to mention *R. margaritacea* was Hagen (1861), who synonymized it under *Mantispa viridula* Erichson, which was later followed by Hagen (1866), Berg (1899) and Penny (1977). Poivre (1982) transferred the species to the genus *Entanoneura* Enderlein without justification. In the revision of the Mantispidae from the Brazilian

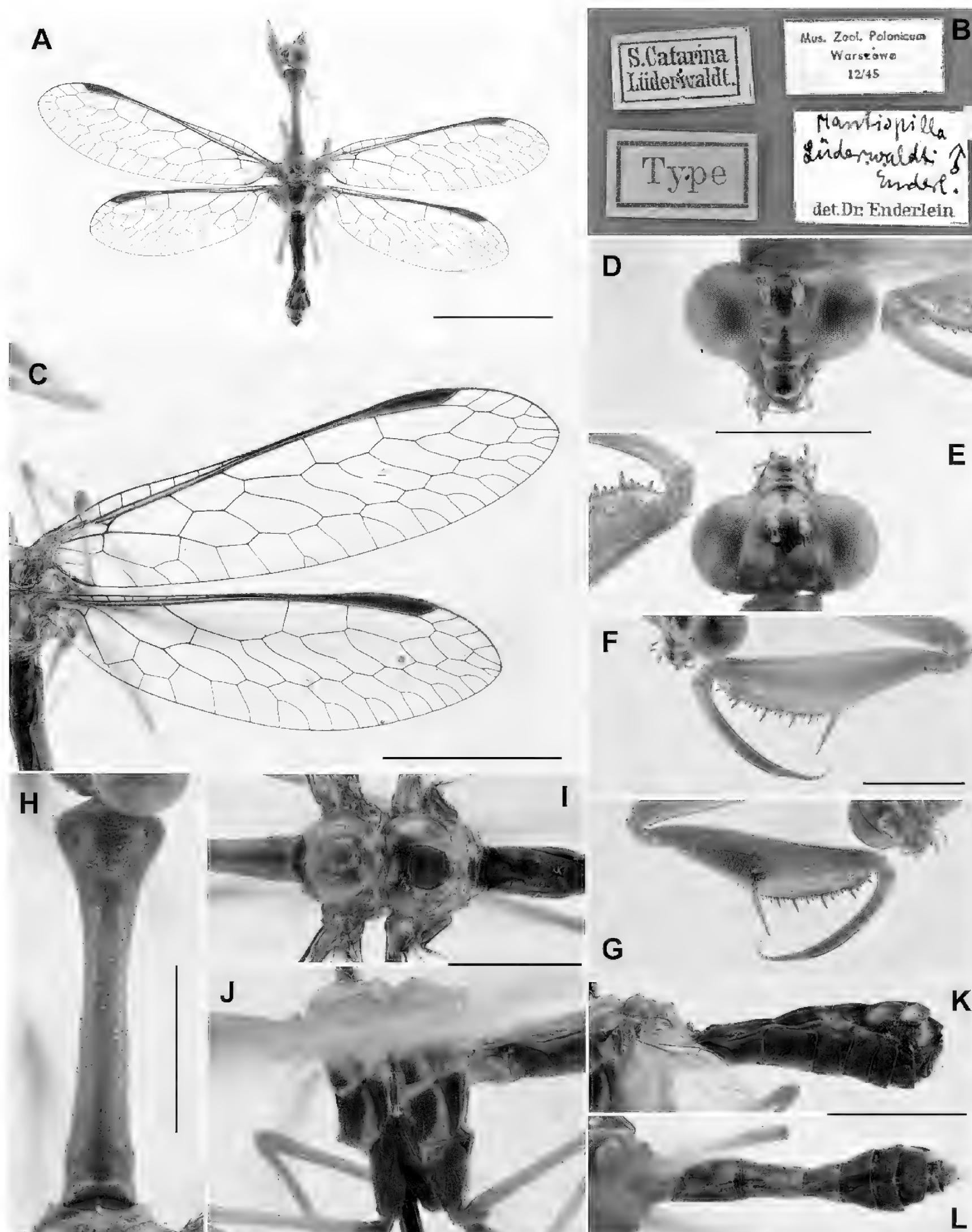


**Figure 12.** *Mantispa lineaticollis* Enderlein 1910, holotype, male. **A.** Habitus photo, dorsal view; **B.** Labels; **C.** Left fore and hind wings; **D, E.** Head, frontal and dorsal views; **F.** Forelegs; **G.** Prothorax, dorsal view; **H, I.** Pterothorax, dorsal and lateral views. **J, K.** Abdomen, lateral and ventral views. Scale bars: 5.0 mm (A, C); 2.0 mm (F, J, K); 1.0 mm (D, E, G–I).

Amazon, Penny (1982) synonymized both *M. viridula* and *R. margaritacea* under *Mantispa minuta* (Fabricius), now in *Zeugomantispa*. The synonymy of *R. margaritacea* under *Z. minuta* was followed by many subsequent authors (Penny and Costa 1983; Carvalho and Corseuil 1995; Ohl 2004; Ardila-Camacho and García 2015; Ardila-Camacho et al. 2018) and it is the most accepted placement today (Oswald 2024). The first species with which

*R. margaritacea* was synonymized, *M. viridula*, is now considered a synonym of *Z. virescens* (Rambur) (see Ohl 2004 for more details).

Later, Machado and Rafael (2010) during their study of the Brazilian Mantispidae, noted that what was previously treated as *M. minuta* in the Brazilian fauna (*sensu* Penny 1982; Penny and Costa 1983; Carvalho and Corseuil 1995) was actually *Z. virescens* and not *Z. minuta*, based



**Figure 13.** *Mantispa luederwaldti* Enderlein 1910, holotype, female. **A.** Habitus photo, dorsal view; **B.** Labels; **C.** Right fore and hind wings; **D, E.** Head, frontal and dorsal views; **F, G.** Forelegs, outer and inner surfaces; **H.** Prothorax, dorsal view; **I, J.** Pterothorax, dorsal and lateral views; **K, L.** Abdomen, lateral and ventral views. Scale bars: 5.0 mm (**A, C**), 2.0 mm (**D-L**).

on the taxonomic arrangement proposed by Hoffman (2002). Despite being present in some neighboring countries, like Colombia and Venezuela, *Z. minuta* is still not recorded from Brazil (Machado and Martins 2022).

In this sense, based on the fact that the type series of *R. margaritacea* is from Brazil, and that it was firstly synonymized under *M. viridula*, it makes sense to associate *R. margaritacea* with *Z. virescens* and not with *Z. minuta*.

Furthermore, if this assumption is true, the oldest name of this species that would prevail would be *R. margaritacea*, and the current accepted name of this species would have to change. However, the lack of the type material of *R. margaritacea* makes it impossible to finally decide on the taxonomic status of this species. Since its original description is also quite uninformative, we are herein considering the species as a *nomen dubium* potentially in *Zeugomantispa*.

***Buyda neotropica* (Navás)**

Fig. 14

*Mantispa neotropica* Navás, 1933: 309. Lectotype: male (MNHN).

Type locality: French Guiana: Nouveau Chantier.

**Notes.** The status of this species is very similar to *M. confluens*. In the original description, Navás (1933) mentioned a female and presented two illustrations: the pronotum and the tip of a forewing. After that, the name was listed by Penny (1977) and included in the catalogue by Ohl (2004). Tauber et al. (2017) stated that although Navás (1933) explicitly mentioned a single female, they could locate a single male only in the MNHN. According to their interpretation, it is unclear if Navás had more than one specimen, but he might also have indicated the wrong sex of the holotype. Tauber et al. (2017) designated the single male specimen in the MNHN as the lectotype. Later, Snyman et al. (2018) transferred the species to *Buyda* without any explicit justification, and finally Ardila-Camacho et al. (2018) synonymized the species under *B. phthisica* (Gerstaecker), but without studying the type. After analyzing the lectotype, we herein confirm the synonymy proposed by Ardila-Camacho et al. (2018). The lectotype of *M. neotropica* has all the major characters of *B. phthisica*, and the description and figures presented by Navás (1933) also matches with *B. phthisica*.

***Zeugomantispa paraguayana* (Ohl)**

Fig. 15

*Mantisvilla nana* Navás, 1912: 201. Lectotype: female (ZSMC) (here designated). Type locality: Paraguay: San Bernardino.*Mantispa paraguayana* Ohl, 2004: 188. Replacement name for *Mantisvilla nana* Navás, 1912, a junior secondary homonym of *Mantispa nana* Erichson, 1839.

**Notes.** The species was originally described as *Mantisvilla nana* by Navás (1912). The author did not explicitly state the number of specimens available to him, but he might have seen more than one specimen. In this sense, we are herein designating the female specimen from ZSMC, the sole specimens found here, as the lectotype. Posterior to the original description the species was only mentioned by Penny (1977), who transferred it to *Mantispa*. Later, Ohl (2004) noticed that after the transference of the species to *Mantispa*, it was now a junior secondary homonym of *Mantispa nana* Erichson, 1839 (today *Afro-mantispa nana*). In this sense, he designated a replacement name for the species, *Mantispa paraguayana*, inspired by its type locality. Posterior to that the name was only mentioned again by Snyman et al. (2018), who treated it as *Mantisvilla paraguayana* (Ohl, 2004). Herein after studying the lectotype, it became obvious that this species is another synonym of *Zeugomantispa virescens* (Rambur, 1842). It has all the major diagnostic characters of the species, like the rugose pronotum (Fig. 15B), the green

pterostigma and the crossveins aa-ap straight in the forewing (Fig. 15C). Therefore, we are herein synonymizing *Mantispa paraguayana* Ohl, 2004 under *Zeugomantispa virescens* (Rambur, 1842) (new synonym).

***Dicromantispa pehlkei* (Enderlein)**

Fig. 16

*Mantispa pehlkei* Enderlein, 1910: 351. Lectotype: female (MZPW) (here designated). Type locality: Colombia.

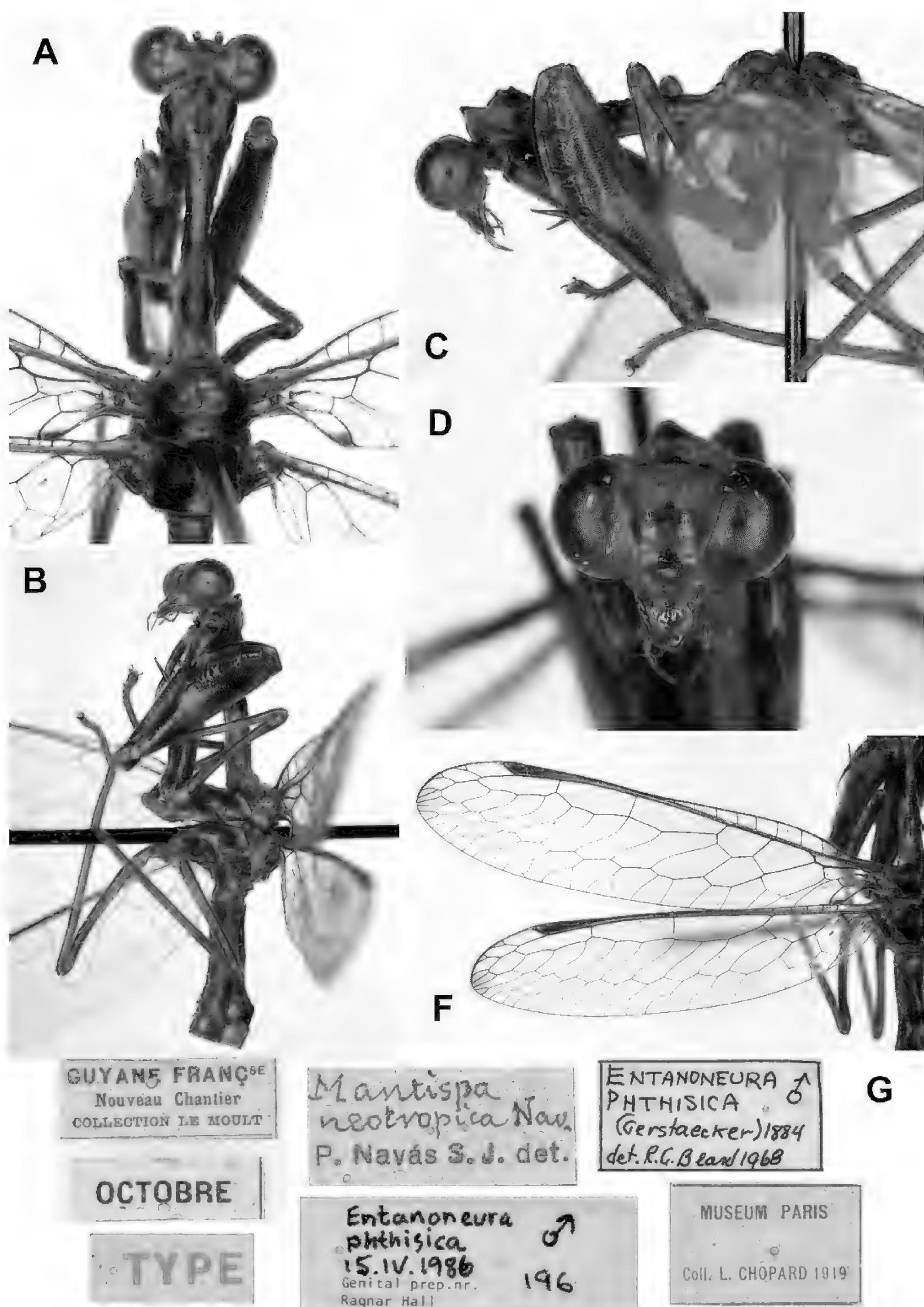
**Notes.** This is another of the Neotropical species, which are still associated with *Mantispa*. The species was described by Enderlein (1910) based on two specimens from Colombia, a female (Fig. 16A–G) and another specimen of unknown sex (its abdomen was probably already lost at that time) (Fig. 16H–Q), both deposited at MZPW. We are herein designating the specimen with the indication of female on the label (Fig. 16G) as the lectotype, because it is in better condition.

The species was listed by Penny (1977) and included at the world catalogue of Mantispidae by Ohl (2004), who stated that the types were probably lost. This information about the types was later followed by Ardila-Camacho and García (2015) and Snyman et al. (2018). We found the two syntypes deposited at MZPW, both with the abdomen broken but one of them containing the information that it is a female, while the other does not show any information about the sex. Despite the relatively poor condition of both syntypes it is clear that the species belongs in *Dicromantispa*. This is based on the overall brown body coloration and the pronotum with a few scattered setae in lateral view (Fig. 16F), as mentioned in the original description (Enderlein 1910). Furthermore, both syntypes present the diagnostic characters of *D. gracilis*, the hyaline wings with some of the major veins yellow (Fig. 16A). *Dicromantispa gracilis* is a widespread species with records from Uruguay to Costa Rica, including Colombia (Ardila-Camacho and García (2015), with a long list of synonyms (Ohl 2004). Enderlein (1910) in the original description mentioned that he did not have access to the types of *M. iridipennis*, another species with the type locality from Colombia, which was herein synonymized under *D. gracilis*.

Based on the arguments stated above we are herein synonymizing *Mantispa pehlkei* Enderlein, 1910 under *Dicromantispa gracilis* (Erichson, 1839) (new synonym).

***Gerstaeckerella riedeliana* (Fischer von Waldheim)***Raphidia riedeliana* Fischer von Waldheim, 1834: 329. Holotype or syntypes: sex unknown (ZIL or ZMUM). Type locality: Brazil

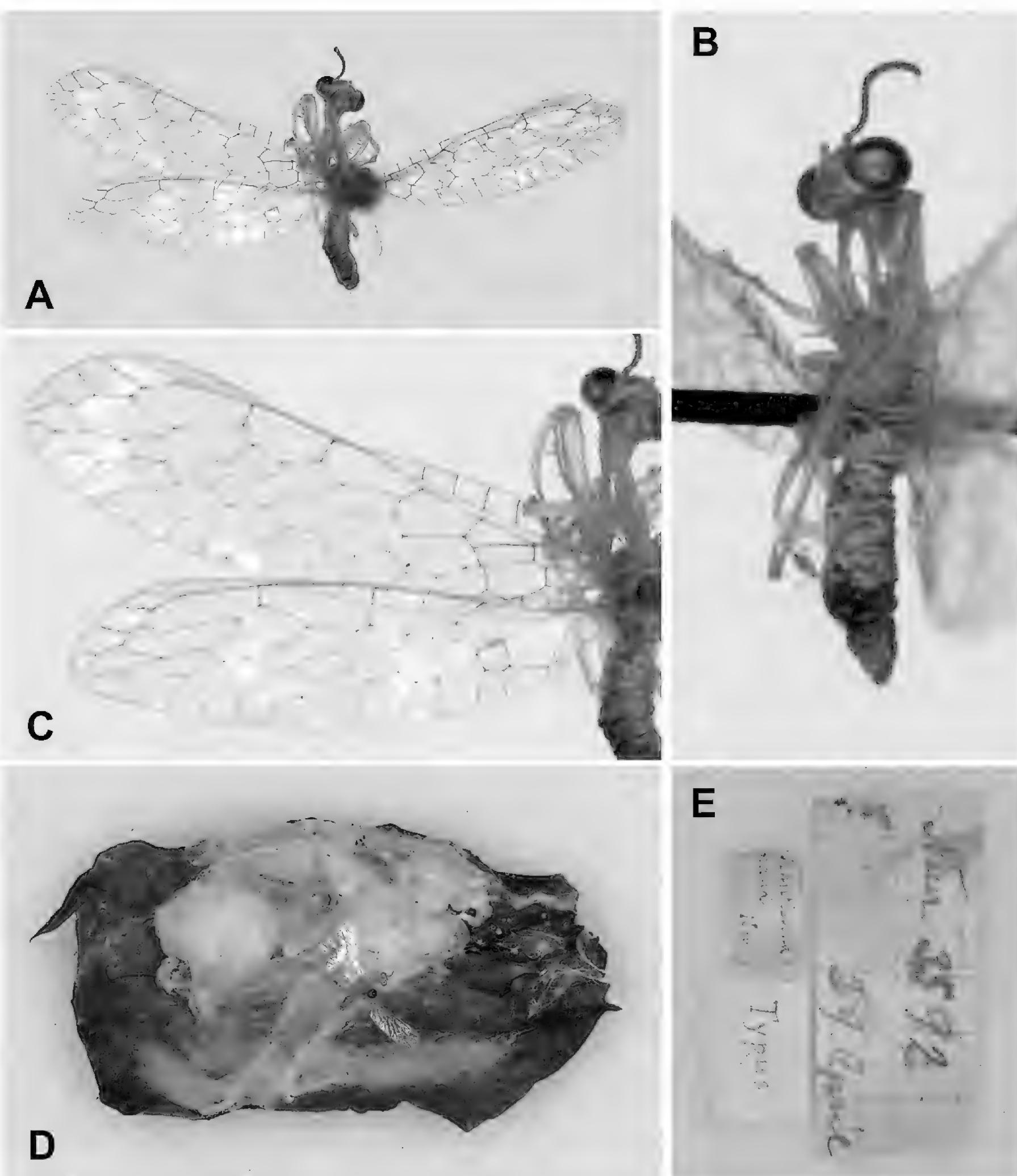
**Notes.** This species is very similar to the *Raphidia marginata*, they were both described in the same paper by Fischer von Waldheim (1834) in his study about the Orthoptera and Neuroptera from Brazil. According to Ohl



**Figure 14.** *Mantispa neotropica* Navás 1933, lectotype, male. **A.** Head and thorax, dorsal view; **B.** Habitus photo, lateral view; **C.** Head and thorax, lateral view; **D.** Head, frontal view; **F.** Left fore- and hind wings; **G.** Labels.

(2004) the type series was supposedly deposited at ZIL or ZMUM, but we were unable to get information about it. It cannot be excluded that the type material is lost. After its publication the species was synonymized under *Mantispa irrorata* Erichson, 1839 (today *Gerstaeckerella irrorata*) by Hagen (1861) despite the fact that the oldest name is *R. riedeliana*. This synonym was posteriorly followed by Penny and Costa (1983) and Carvalho and Corseuil (1991). However as discussed by Ohl (2004), despite the

synonym proposed by Hagen (1861), the same author posteriorly considered the species as valid again (Hagen 1866). In this sense, Ohl (2004) decided to keep the species as valid but transferred it to *Gerstaeckerella* based on the original description. Since the location of the type material is still unknown, we refrain from proposing any taxonomic decision here, keeping it as a valid species in *Gerstaeckerella* as proposed by Ohl (2004) and followed by Machado and Martins (2022).



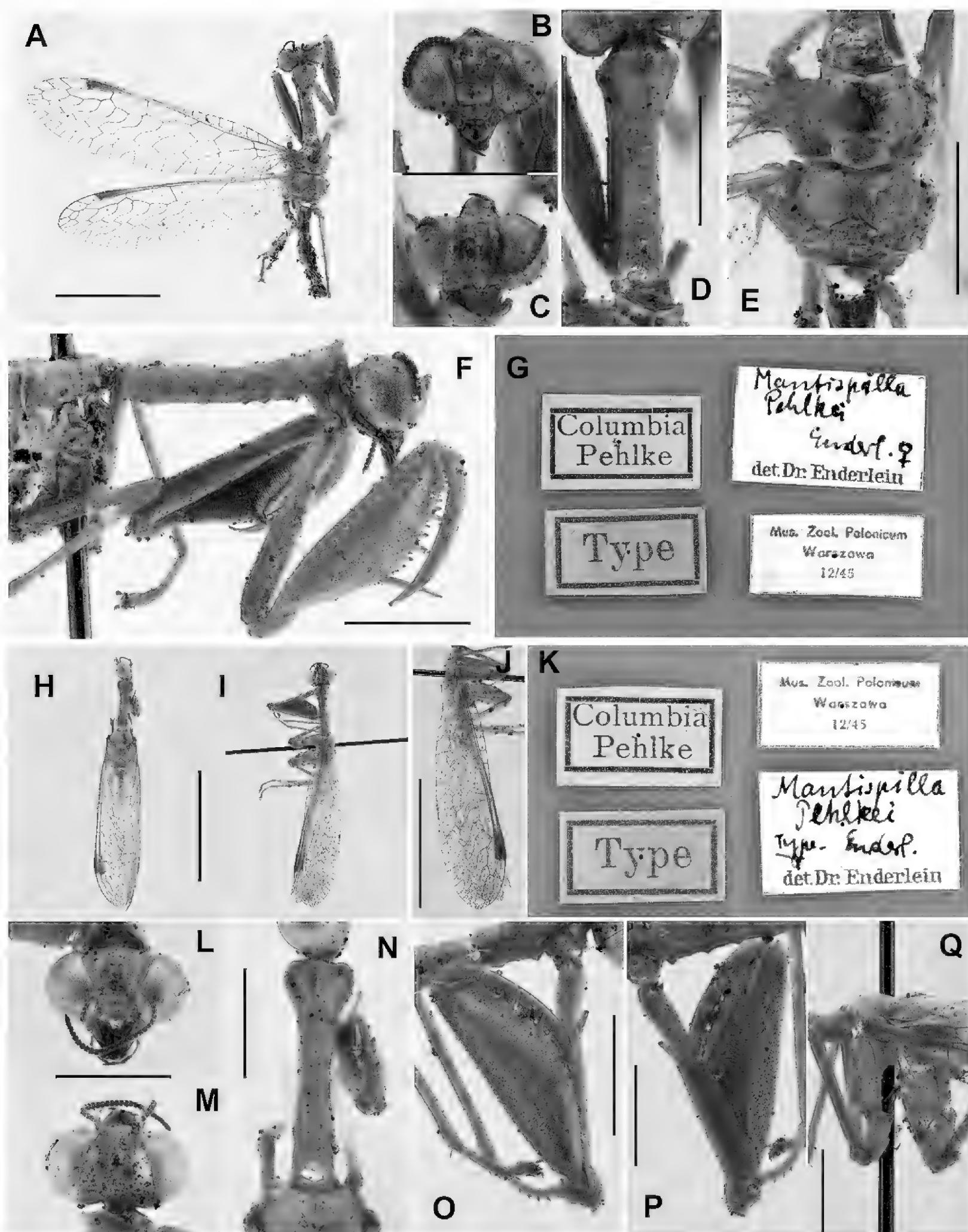
**Figure 15.** *Mantispilla nana* Navás 1912, lectotype, female. **A, B.** Habitus photo, dorsal and lateral views; **C.** Left fore and hind wings; **D.** Cocoons; **E.** Labels.

#### *Mantispilla rimata* Navás

*Mantispilla rimata* Navás, 1929b: 322. Holotype: sex unknown (ZMUH, likely lost). Type locality: Brazil: São Paulo: Santos.

**Notes.** This species was described by Navás (1929b) from the municipality of Santos, at the state of São Paulo, Brazil. Ohl (2004) and Snyman et al. (2018) expressed doubts if the description was based on one or more specimens, but in the original description the author clearly mentioned that the type has one extra crossvein on the first radial cell on the right forewing, suggesting that

there was only one type specimen. After the original description it was treated in *Mantispa* by Penny (1977), Ohl (2004), and Snyman et al. (2018). The holotype was originally deposited in the ZMUH. However, this collection was basically destroyed during World War II, and apparently the whole Neuroptera collection was ruined, indicating that the types of all species in Mantispidae were lost (Ohl 2004). Based solely on the original description it is impossible to associate this species with one of the current valid genera in Mantispidae, and for this reason and the absence of the holotype, we are herein considering this species as a *nomen dubium*.



**Figure 16.** *Mantispa pehlkei* Enderlein 1910, type material. **A–G.** Lectotype, female: **A.** Habitus photo, dorsal view; **B, C.** Head, frontal and dorsal views; **D.** Prothorax, dorsal view; **E.** Pterothorax, dorsal view; **F.** Head and thorax, lateral view; **G.** Labels; **H–Q.** Paralectotype, sex unknown: **H, I.** Habitus photo, dorsal and lateral views; **J.** Wings details; **K.** Labels; **L, M.** Head, frontal and lateral views; **N.** Prothorax, dorsal view; **O, P.** Foreleg, outer and inner surfaces; **Q.** Pterothorax, lateral view. Scale bars: 10.0 mm (H–J); 5.0 mm (A); 2.0 mm (B–F, L–Q)

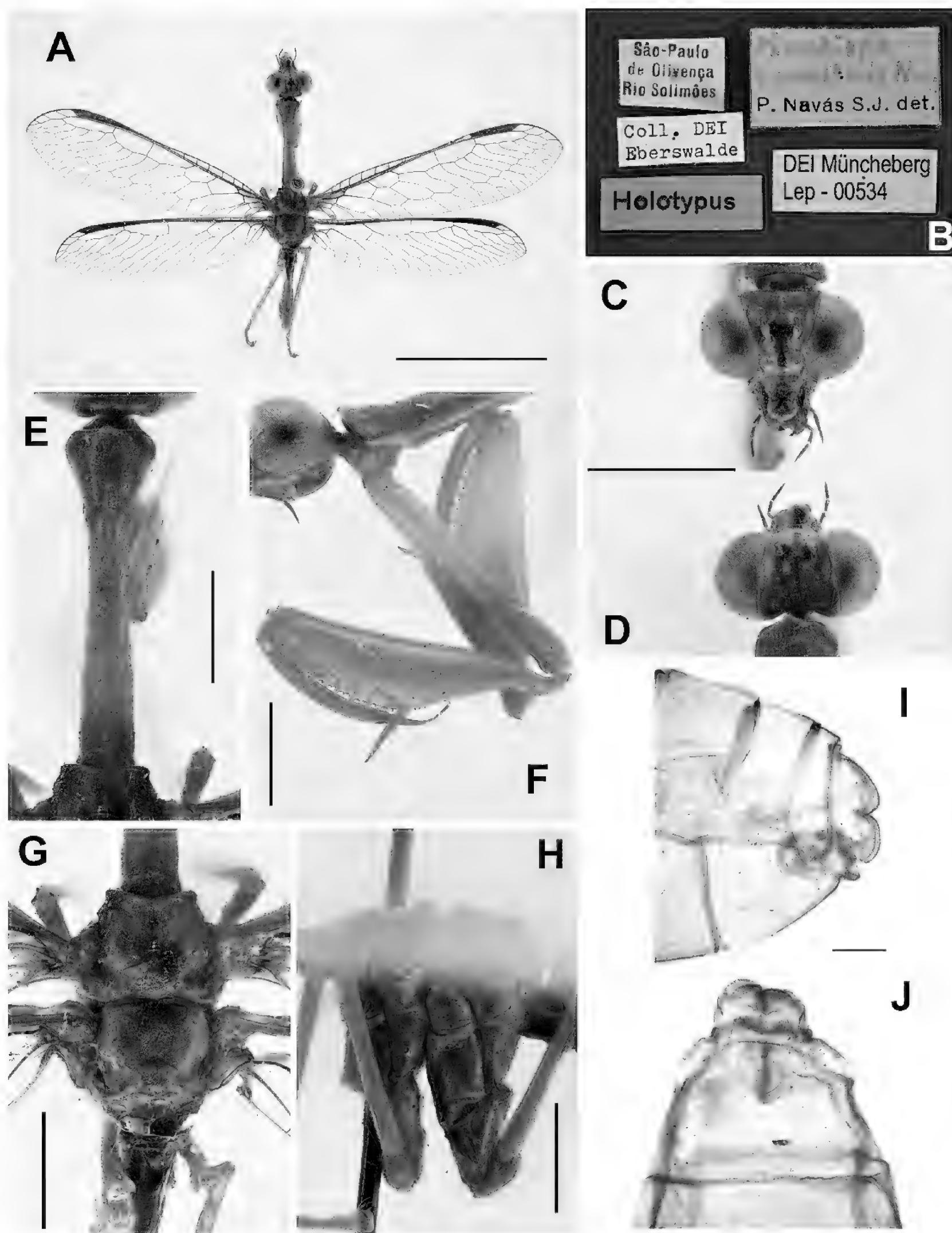
#### *Dicromantispa subcostalis* (Navás)

Fig. 17

*Mantispa subcostalis* Navás, 1929a: 115. Holotype: female (DEI). Type locality: Brazil: Amazonas: São Paulo de Olivença.

**Notes.** This is another Neotropical species, which is still placed in *Mantispa*. The species was described by Navás (1929a), explicitly based on one female from the Amazonas state in Brazil. More precisely, the holotype is from

the municipality of São Paulo de Olivença, located at the margin of the Solimões river (which is the name of the Amazon river before the junction with the Negro river), a remote area in the middle of the Amazon rainforest, very close to the borders of Colombia and Peru. The species was only listed by Penny (1977) and Snyman et al. (2018) and included in the world catalogue of Mantispidae (Ohl 2004). After analyzing the holotype, it is clear that it belongs in *Dicromantispa*, based on the overall brown body color and the pronotum with a few scattered setae



**Figure 17.** *Mantispa subcostalis* Navás 1929, holotype, female. A. Habitus photo, dorsal view; B. Labels; C, D. Head, frontal and dorsal views; E. Prothorax, dorsal view; F. Foreleg, outer surface; G–H. Pterothorax, dorsal and lateral views; I–J. Genitalia, lateral and ventral views. Scale bars: 10.0 mm (A); 2.0 mm (C–H); 0.5 mm (I, J).

(Fig. 17E). However, *M. subcostalis* does not match the diagnostic characters of any of the currently valid species, and for this reason we are considering it as a valid species, *Dicromantispa subcostalis* (Navás) (new combination).

*Dicromantispa* until now is represented by eight valid extant species, two of them are restricted to Central and North America, *D. interrupta* (Say) and *D. sayi* (Banks). These can be easily distinguished from *D. subcostalis* based on the wings and dark pronotal marks, respectively. Like *D. subcostalis*, all other six species

have records from Brazil. *Dicromantispa gracilis* and *D. hyalina* Machado and Rafael have the base of their forewings hyaline, separating them from *D. subcostalis* (Fig. 17A). The dark brown costal area in the hind wings of *D. leucophaea* Machado and Rafael and *D. moulti* (Navás) separate them from *D. subcostalis*. The continuous longitudinal dark line in the frons of *D. subcostalis* (Fig. 17C) easily separates it from *D. luederwaldti* (see discussion above), additionally the marks on the vertex and the shape of the female sternite nine also distinguish

them. The remaining species is *D. debilis*, which apparently is more similar to *D. subcostalis*, but their pronotal marks are different, and more importantly, the inner forefemoral surface of *D. debilis* is dark brown, while in *D. subcostalis* it is light brown (Fig. 17F). In fact, the light brown forefemur inner surface is unique to *D. subcostalis*, while all other *Dicromantispa* species have the forefemur inner surface entirely dark brown or with at least with a large dark mark. In this sense, *D. subcostalis* is considered herein as a valid species known only by the female holotype from a remote area in the middle of the Amazon rainforest in Brazil. Future field work in this area will be important to collect male specimens in order to confirm its taxonomic identity.

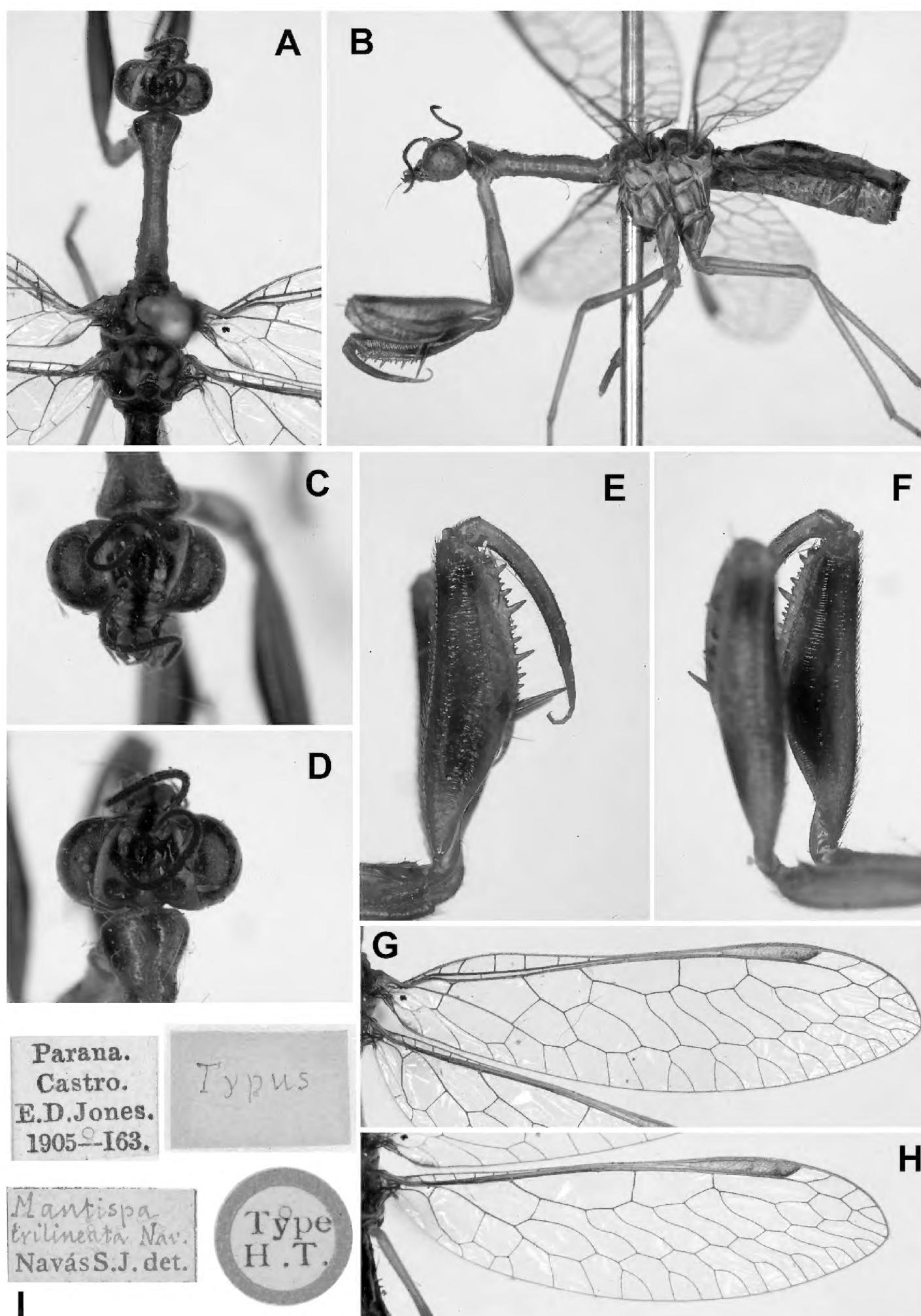
### *Leptomantispa trilineata* (Navás)

Fig. 18

*Mantispa trilineata* Navás, 1914b: 230. Holotype: female (NHMUK).

Type locality: Brazil: Paraná: Castro.

**Notes.** This species was described by Navás, (1914b) explicitly based on one specimen from the municipality of Castro, in the state of Paraná in southern Brazil. It was later reported from Argentina (Navás 1921) and listed by Penny (1977). However, the first review of the species was published by Penny (1982), who mentioned that after studying the female holotype from NHMUK, he considered *M. trilineata* to be a junior synonym of *M. gracilis* (now in *Dicromantispa*).



**Figure 18.** *Mantispa trilineata* Navás 1914, holotype, female. **A.** Head and thorax, dorsal view; **B.** Habitus photo, lateral view; **C, D.** Head, frontal and dorsal views; **E, F.** Foreleg, outer and inner surfaces; **G, H.** Right fore and hind wings; **I.** Labels.

The synonym proposed by Penny (1982) was followed by all subsequent authors (Penny and Costa 1983; Carvalho and Corseuil 1995; Ohl 2004; Machado and Rafael 2010; Ardila-Camacho and García 2015; Ardila-Camacho et al. 2018). Herein, after analyzing the female holotype, it is clear to us that the species is, in fact, not a synonym of *D. gracilis* as currently accepted. Instead, the species clearly belongs in *Leptomantispa*: it presents all the diagnostic characters of the genus as described by Hoffman (2002): forewing without a mark posterior to cell 1MP, and Sc and RA forming an angle between 40–50° (Fig. 18G), but most importantly the presence of prominent setae arising flush to the entire pronotal dorsal surface (Fig. 18B). Furthermore, *M. trilineata* perfectly matches with the specimens that are currently identified as *L. axillaris* (see discussion above). The overall body color is markedly similar, although the holotype of *M. trilineata*

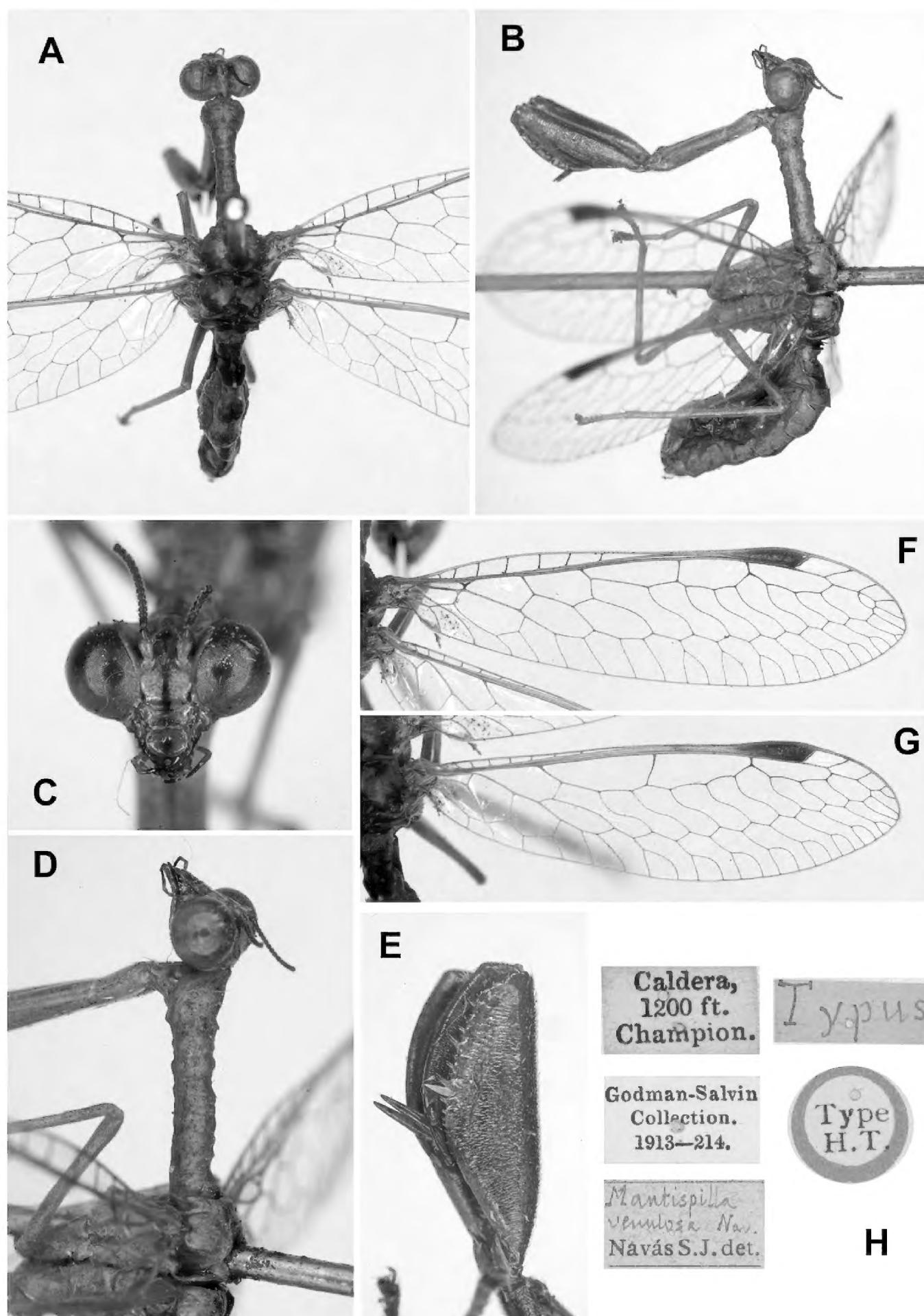
color seems a little faded, and the subcostal area in the forewing is hyaline (Fig. 18G). Additionally, *L. axillaris* can be easily collected in Paraná state including at the type locality of *M. trilineata*. In this sense, we are herein synonymizing *Mantispa trilineata* Navás, 1914 under *Leptomantispa axillaris* (Navás, 1908). (new combination, new synonym)

### *Dicromantispa venulosa* (Navás)

Fig. 19

*Mantisvilla venulosa* Navás, 1914c: 85. Lectotype (here designated): female (NHMUK). Type locality: Central America: Caldera.

**Notes.** The status of this species is very similar to *Mantisvilla flavicauda* as discussed above. It was described



**Figure 19.** *Mantisvilla venulosa* Navás 1914, lectotype, female. **A, B.** Habitus photo, dorsal and lateral views; **C.** Head, frontal view; **D.** Head and prothorax, lateral view; **E.** Foreleg, outer view; **F, G.** Right fore and hind wings; **H.** Labels.

by Navás (1914c) from an unprecise location in Central America, but the number of specimens used for the description was not clear. In this sense, we are herein designating the female from NHMUK, the sole specimen found here, as the lectotype. After the original description the species was treated in *Mantispa* by Penny (1977) and Ohl (2004), and more recently transferred to *Dicromantispa* without justification by Snyman et al. (2018). Herein after analyzing the lectotype we agree with Snyman et al. (2018) that the species belongs to *Dicromantispa*. However, the lectotype shows all the major characters of *D. gracilis*, like hyaline wings with some of the major veins being yellow (Fig. 19F, G). In this sense, we are herein synonymizing *Mantisvilla venulosa* Navás, 1914 under *Dicromantispa gracilis* (Erichson, 1839) (new synonym).

## Acknowledgments

We are thankful to all collection staff members who made specimens available to us: Stefanie Krause, Birgit Jaenicke and Bernhard Schurian from the Museum für Naturkunde, Berlin (MfN) and André Nel from the Muséum national d'Histoire naturelle, Paris (MNHN). We also want to thank Yuchen Zheng for the help with some specimens. HYL expresses his gratitude to his Chinese supervisor, Xingyue Liu, for the strong financial support and guidance provided during his research abroad. He also thanks the China Scholarship Council (CSC) for the grant (No. 202106350102). RJPM thanks the CNPq for the grant CNPq/MCTI/FNDCT (No 18/2021; 402785/2021-5).

## References

Alayo DP (1968) Los Neurópteros de Cuba. *Poeyana* (B) 2: 1–127.

Alvim BGC, Machado RJP, Krolow TK (2019) Mantidflies (Neuroptera, Mantispidae) from Tocantins state (Brazil): Distribution and identification key. *Check List* 15(2): 275–285. <https://doi.org/10.15560/15.2.275>

Alvim BGC, Machado RJP, Krolow TK (2024) Review of the Brazilian species of the genus *Climaciella* Enderlein (Neuroptera, Mantispidae), with description of two new species. *Anais da Academia Brasileira de Ciências* 96(4): e20230788.

Ardila-Camacho A, Contreras-Ramos A (2025) Phylogenetic position of the subfamily Symphrasinae (Insecta: Neuroptera), its intergeneric relationships and evolution of the raptorial condition within Mantipoidea. *Invertebrate Systematics* 39(1): IS24033. <https://doi.org/10.1071/IS24033>

Ardila-Camacho A, García A (2015) Mantidflies of Colombia (Neuroptera, Mantispidae). *Zootaxa* 3937(3): 401–455. <https://doi.org/10.11646/zootaxa.3937.3.1>

Ardila-Camacho A, Calle-Tobón A, Wolff M, Stange LA (2018) New species and new distributional records of Neotropical Mantispidae (Insecta: Neuroptera). *Zootaxa* 4413(2): 295–324. <https://doi.org/10.11646/zootaxa.4413.2.4>

Ardila-Camacho A, Martins CC, Aspöck U, Contreras-Ramos A (2021) Comparative morphology of extant raptorial Mantipoidea (Neuroptera: Mantispidae, Rhachiberothidae) suggests a non-monophyletic Mantispidae and a single origin of the raptorial condition within the superfamily. *Zootaxa* 4992(1): 1–89. <https://doi.org/10.11646/zootaxa.4992.1.1>

Ardila-Camacho A, Winterton SL, Contreras-Ramos A (2023) The genus *Climaciella* Enderlein, 1910 (Neuroptera, Mantispidae) in French Guiana. *ZooKeys* 1153: 37–64. <https://doi.org/10.3897/zookeys.1153.95960>

Ardila-Camacho A, Machado RJP, Ohl M, Contreras-Ramos A (2024) A camouflaged diversity: Taxonomic revision of the thorny lacewing subfamily Symphrasinae (Neuroptera, Rhachiberothidae). *ZooKeys* 1199: 1–409. <https://doi.org/10.3897/zookeys.1199.115442>

Berg C (1899) Los mantispidos de la República Argentina. *Comunicaciones del Museo Nacional de Buenos Aires* 1: 139–145.

Carvalho AL, Corseuil E (1991) Representantes de Platymantispinae (Neuroptera, Mantispidae) no RioGrande do Sul, Brasil. *Comunicações do Museu de Ciências da PUCRS, Série Zoologia* 4(4): 49–70.

Carvalho AL, Corseuil E (1995) Caracterização das espécies de *Mantispa* Illiger ocorrentes no Rio Grande do Sul (Neuroptera, Mantispidae). *Revista Brasileira de Zoologia* 12(4): 839–858. <https://doi.org/10.1590/S0101-81751995000400014>

Enderlein G (1910) Klassifikation der Mantispiden nach dem material des Stettiner Zoologischen Museums. *Stettiner Entomologische Zeitung* 71: 341–379.

Erichson WF (1839) Beiträge zu einer Monographie von *Mantispa*, mit einleitenden Betrachtungen über die Ordnungen der Orthopteren und Neuropteren. *Zeitschrift für die Entomologie (Germar)* 1: 147–173.

Fischer von Waldheim G (1834) Notice sur quelques Orthoptères et Nevroptères du Brésil. *Bulletin de la Société des Naturalistes de Moscou* 7: 322–330.

Guérin-Méneville FÉ (1844) *Iconographie du règne animal de G. Cuvier, ou représentation d'après nature de l'une des espèces les plus remarquables, et souvent non encore figurées, de chaque genre d'animaux. Insectes*. Paris, 576 pp.

Hagen HA (1861) Synopsis of the Neuroptera of North America, with a list of the South American species. *Smithsonian Miscellaneous Collections* 4(1): 1–347. <https://doi.org/10.5962/bhl.title.60275>

Hagen HA (1866) *Hemerobidarum Synopsis synonymica*. *Stettiner Entomologische Zeitung* 27: 369–462.

Handschin E (1960) Zur Revision süd-amerikanischer Mantispiden. *Revue Suisse de Zoologie* 67: 523–560. <https://doi.org/10.5962/bhl.part.75281>

Hoffman KM (1989) Taxonomic status of *Mantispa sayi*, *Mantispa fusicornis*, and *Mantispa uhleri* (Neuroptera: Mantispidae). *Proceedings of the Entomological Society of Washington* 91: 637–639.

Hoffman KM (2002) Family Mantispidae. In: Penny ND (Ed.) *A Guide to the Lacewings (Neuroptera) of Costa Rica*. *Proceedings of the California Academy of Sciences* 53(4): 251–275.

Hoffman KM, Flint OS, Pérez-Gelabert DE (2017) The Mantispidae of the West Indies with special reference to the Dominican Republic (Neuroptera: Mantispidae). *Insecta Mundi* 559: 1–15.

Lai Y, Du S, Li H, Zheng Y, Ardila-Camacho A, Aspöck U, Aspöck H, Yang D, Zhang F, Liu X (2024) lacewing-specific universal single copy orthologs designed towards resolution of backbone phylogeny of Neuroptera. *Systematic Entomology*, 1–16. <https://doi.org/10.1111/syen.12657>

Lambkin KJ (1986) A revision of the Australian Mantispidae (Insecta: Neuroptera) with a contribution to the classification of the family. II.

Calomantispinae and Mantispinae. Australian Journal of Zoology. Supplementary Series 117: 1–113. <https://doi.org/10.1071/AJZS117>

Machado RJP, Martins CC (2022) The extant fauna of Neuroptera (Insecta) from Brazil: diversity, distribution and history. Revista Brasileira de Entomologia 66(spe): e20220083. <https://doi.org/10.1590/1806-9665-rbent-2022-0083>

Machado RJP, Rafael JA (2007) A new species of Mantispidae (Insecta: Neuroptera) from Central Amazonia, Brazil. Zootaxa 1530(1): 37–40. <https://doi.org/10.11646/zootaxa.1530.1.5>

Machado RJP, Rafael JA (2010) Taxonomy of the Brazilian species previously placed in *Mantispa* Illiger, 1798 (Neuroptera: Mantispidae), with the description of three new species. Zootaxa 2454(1): 1–61. <https://doi.org/10.11646/zootaxa.2454.1.1>

Navás L (1908) Neurópteros nuevos. Memorias de la Real Academia de Ciencias y Artes de Barcelona 6(3): 401–423.

Navás L (1912) Neurópteros nuevos de América. Brotéria (Zoológica) 10: 194–202.

Navás L (1914a) Névroptères nouveaux de l’Amerique du Nord. IIème série. Entomologische Zeitschrift, Frankfurt am Main 28: 18–20.

Navás L (1914b) Neurópteros sudamericanos. Primera [I] serie. Brotéria (Zoológica) 12: 45–56, 215–234.

Navás L (1914c) Mantispidos nuevos (Segunda [II] serie). Memorias de la Real Academia de Ciencias y Artes de Barcelona 11(3): 83–103.

Navás L (1921) Algunos insectos de Santa Fe (República Argentina). Estudios, Revista Mensual (Academia literaria del Plata, Buenos Aires) 21: 49–53.

Navás L (1926a) Insectos exóticos Neurópteros y afines. Brotéria (Zoológica) 23: 79–93.

Navás L (1926b) Algunos insectos del Brasil (3.a serie). Brotéria (Zoológica) 23: 5–15.

Navás L (1927) Veinticinco formas nuevas de insectos. Boletín de la Sociedad Ibérica de Ciencias Naturales 26: 48–75.

Navás L (1929a) Insectos neotropicos. 4.a serie. Revista Chilena de Historia Natural 32: 106–128.

Navás L (1929b) Insectos Neurópteros del Museo de Hamburgo. Memorias de la. Sociedad Española de Historia Natural 15: 315–322.

Navás L (1933) Insectos suramericanos. Septima [VII] serie. Revista de la Real Academia de Ciencias Exactas Fisicas y Naturales de Madrid 30: 303–314.

Navás L (1934) Insectos suramericanos. Octava [VIII] serie. Revista de la Real Academia de Ciencias Exactas Fisicas y Naturales de Madrid 31: 9–28.

Ohl M (2004) Annotated catalog of the Mantispidae of the World (Neuroptera). Contributions on Entomology. International 5: 131–262.

Oswald JD (2024) Neuropterida Species of the World. Lacewing Digital Library, Research Publication No. 1. <http://lacewing.tamu.edu/SpeciesCatalog/Main>. Last accessed [17.x.2024].

Penny ND (1977) Lista de Megaloptera, Neuroptera e Raphidioptera do México, América Central, ilhas Caraíbas e América do Sul. Acta Amazonica 7(4, Suplemento): 1–61. <https://doi.org/10.1590/1809-43921977074s005>

Penny ND (1982) Neuroptera of the Amazon Basin. Part 6. Mantispidae. Acta Amazonica 12(2): 415–463. <https://doi.org/10.1590/1809-43921982122415>

Penny ND, Costa CA (1983) Mantispídeos do Brasil (Neuroptera: Mantispidae). Acta Amazonica 13(3–4): 601–687. <https://doi.org/10.1590/1809-439219831334601>

Poivre C (1978) Morphologie externe comparée de *Gerstaeckerella gigantea* Enderlein. Annales de la Société Entomologique de France 14(2): 191–206. <https://doi.org/10.1080/21686351.1978.12278686>

Poivre C (1982) Les Mantispidés du Muséum d’Histoire naturelle de Genève. I. (Insecta, Planipennia). Revue Suisse de Zoologie 89: 375–378. <https://doi.org/10.5962/bhl.part.82449>

Rambur JP (1842) Histoire naturelle des insectes, névroptères. Librairie encyclopédique de Roret. Fain et Thunot, Paris. [xviii] + 534 pp.

Reynoso-Velasco D, Contreras-Ramos A (2010) Overview of the taxonomic and biological knowledge of Mexican Mantispidae (Insecta: Neuroptera), pp. 269–276. In: Devetak D, Lipovšek S, Arnett AE (Eds). Proceedings of the 10<sup>th</sup> International Symposium on Neuropterology. University of Maribor, Maribor, Slovenia, 307 pp.

Snyman LP, Sole CL, Ohl M (2018) A revision of and keys to the genera of the Mantispinae of the Oriental and Palearctic regions (Neuroptera: Mantispidae). Zootaxa 4450(5): 501–549. <https://doi.org/10.11646/zootaxa.4450.5.1>

Snyman LP, Ohl M, Pirk CWW, Sole CL (2020) A review of the biology and biogeography of Mantispidae (Neuroptera). Insect Systematics & Evolution 52(2): 125–166. <https://doi.org/10.1163/1876312X-bja10002>

Stange LA (1967) Catalogo de Neuroptera de Argentina y Uruguay. Acta Zoológica Lilloana 22: 5–87.

Tauber CA, Legrand J, Albuquerque GS, Ohl M, Tauber AJ, Tauber MJ (2017) Navás’ specimens of Mantispidae (Neuroptera) in the Muséum National d’Histoire Naturelle, Paris. Proceedings of the Entomological Society of Washington 119(2): 239–263. <https://doi.org/10.4289/0013-8797.119.2.239>

Tauber CA, Simmons Z, Tauber AJ (2019) Type specimens of Neuropterida in the Hope Entomological Collection, Oxford University Museum of Natural History. ZooKeys 823: 1–126. <https://doi.org/10.3897/zookeys.823.30231>

Walker F (1853) List of the specimens of neuropterous insects in the collection of the British Museum. Part II (Sialidae--Nemopterides). British Museum, London. [iii] + 193–476.

Westwood JO (1852) On the genus *Mantispa*, with descriptions of various new species. Transactions of the Royal Entomological Society of London 6(8): 252–270. <https://doi.org/10.1111/j.1365-2311.1852.tb02505.x>

Williner GJ, Kormilev NA (1958) Notas sobre Mantispidae neotropicales, I (Neuroptera). Revista de la Sociedad Entomológica Argentina 21: 1–18.

Winterton SL, Lemmon AR, Gillung JP, Garzón IJ, Badano D, Bakkes DK, Breitkreuz LCV, Engel MS, Lemmon EM, Liu X, Machado RJP, Skevington JH, Oswald JD (2018) Evolution of lacewings and allied orders using anchored phylogenomics (Neuroptera, Megaloptera, Raphidioptera). Systematic Entomology 43(2): 330–354. <https://doi.org/10.1111/syen.12278>